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A Distinguished Visitor from Overseas

WE are glad of the opportunity this week of welcoming Mr. S. J. Hungerford, Chairman and President of the Canadian National Railways, who is visiting London. As will be seen from the brief biography (and portrait) of Mr. Hungerford, on page 704, his career has been a remarkable one. From a locomotive apprentice in 1886, he has risen to be the chief executive officer of the largest railway system in the Western Hemisphere, and of the new Canadian trans-continental air transport system. After considerable service with the C.P.R., he joined the Canadian Northern Railway, a constituent of the present National system, and as the Intercolonial, National Trans-continental, and Grand Trunk Pacific lines subsequently came into the group, he came to know the organisation, business methods, and operation of all the Canadian railways. When, in 1923, he was chosen by the late Sir Henry Thornton as Vice-President in Charge of Operation, Maintenance, and Construction of the whole National system, the task of co-ordinating the various properties into an operating entity fell to him. Throughout the whole period of vast change in railroading, Mr. Hungerford has kept abreast of every improvement and development. As he knew the weakness and the limitations of the early engines and trains, so, also, he knows the intricate details and the capacity of the latest types of engine on the National system and these represent, in large measure, the results of his own experience. Mr. Hungerford's career, however, has been founded not alone upon his marked success in the mechanical divisions of the railway industry. He has long been recognised as one of the outstanding railway operating officers of the North American Continent, and as an administrator of great ability. Whether the problems be those of traffic or finance, or those relating to the ancillary services such as telegraphs, express, hotels, &c., his judgment commands the respect of those who have specialised in such fields.

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Litter

A correspondent writing to *The Times* recently made the suggestion that a great deal of the litter that so lamentably mars the beauty of our countryside might be avoided if the manufacturers or distributors of tobacco and chocolate would offer prizes for the return of a sufficient number of empty cartons. If this could be done one of the first places to show the effect would be the average railway smoking carriage. The condition of these vehicles at the end of a working day can only be said to be a sorry reflection on the habits of the travelling public. The average tobacco addict, as may be observed in any smoking carriage any day, simply drops on the floor where he sits the paper or empty carton which has contained his tobacco, and similarly with the used match, even when there is an ashtray at his disposal. Whether the provision of more of these receptacles would improve matters is doubtful. The fact that the "non-smoking" carriages are a model of cleanliness in comparison, seems to show that the habit of smoking is responsible for most of the litter, at any rate on the railways. Could some expedient be introduced successfully on the lines of the suggestion made by the correspondent to *The Times*, the railways and their passengers would be the first to benefit by it.

* * * *

The Week's Traffics

A total increase of £147,000, made up of £55,000 from passenger train traffic, £54,000 from merchandise, and £38,000 from coal is shown by the four main line companies together for the past week. This total compares with £135,000 for the previous week and £146,000 for the week before that. Noticeable in the return for the past week is the comparatively large merchandise increase on the Southern. For the year to date the four companies together have taken £129,931,000, an increase of £5,419,000 or 4·35 per cent.

	41st Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R. ..	+ 22,000	+ 30,000	+ 11,000	+ 63,000	+ 2,012,000	+ 4·00
L.N.E.R. ..	+ 21,000	+ 2,000	+ 20,000	+ 43,000	+ 1,735,000	+ 4·76
G.W.R. ..	+ 2,000	+ 14,000	+ 8,000	+ 24,000	+ 1,068,000	+ 5·12
S.R. ..	+ 10,000	+ 8,000	− 1,000	+ 17,000	+ 604,000	+ 3·58

London Transport receipts for the past week show an increase of £7,900, bringing the improvement for the 16 weeks up to £39,900. Mersey Railway traffics to date are £5,198 up. The Great Northern Railway (Ireland) has a net increase of £300 for the past week, and the Great Southern a net decrease of £1,345.

* * * *

The Nottingham Canal

The Nottingham Canal, 14 miles 64 chains in length, was originally constructed under an Act of 1792 and is now the property of the London & North Eastern Railway

Company. It begins by a junction with the River Trent near Nottingham, and, passing through Nottingham and the villages of Woolaton, Trowell, Cossall, Awsworth, and Eastwood, terminates by a junction with the Cromford Canal near Langley Mill. Belonging to the Canal are the Poplar Arm of 15 chains, and the Brewery Cut of 12 chains connecting with it, both of which are in the Nottingham area. The canal connects with the Beeston Cut in Lenton, which belongs to the Trent Navigation Company. On the western portion of the canal, 12 miles 2 chains, from the junction with the Beeston Cut to Eastwood, the traffic for many years was negligible and has now for some considerable time ceased altogether. By the L.N.E.R. Act, 1937, the railway company is released from the obligation to maintain this portion in a navigable condition, but must still maintain it as an efficient part of the land drainage system of the River Trent catchment area. It is also required, as a protection to the Grand Union Canal, to maintain adequately the Moor Green reservoir and to carry out and maintain works for preventing water in the Cromford Canal from passing into the "western portion." Scheduled to and authorised by the same Act there is an agreement to lease the "eastern portion" of the Nottingham Canal, with the Poplar Arm and Brewery Cut, to the Trent Navigation Company, for 99 years at an annual rent of £300, with an option to purchase outright for £5,000. This eastern portion of 2 miles 35 chains and the Beeston Cut together constitute a waterway regularly used by barges.

* * * *

Overseas Railway Traffics

In Argentine currency the Buenos Ayres Great Southern Railway shows for the first 16 weeks of the current financial year an increase of 988,000 pesos or 3·35 per cent., and the corresponding increase on the Buenos Ayres Western is 1,046,000 pesos or 9·86 per cent. During the past two weeks the Great Southern has further improved its traffic position in sterling by £26,244, the Western by £14,644, and the Buenos Ayres & Pacific by £7,440. The Central Argentine, on the other hand, is £52,086 worse off for the fortnight, but it must be remembered that in the corresponding period a year ago this company had an increase of £64,970, and was £291,317 up for the 16 weeks.

	No. of Week	Weekly Traffics	Inc. or Decrease	Aggregate Traffic	Inc. or Decrease
		£	£	£	£
Buenos Ayres & Pacific ..	16th	83,313	+ 4,019	1,250,994	+ 72,125
Buenos Ayres Great Southern ..	16th	130,831	+ 18,596	1,889,516	+ 160,144
Buenos Ayres Western	16th	49,628	+ 8,922	722,954	+ 100,488
Central Argentine	16th	115,779	− 23,062	2,086,143	− 95,829
Canadian Pacific	41st	651,200	+ 10,800	22,346,800	+ 1,079,800
Bombay, Baroda & Central India	27th	225,525	+ 16,575	4,592,175	+ 333,525

Central Uruguay receipts for the 15 weeks of the current year show an increase of £2,589, but a decrease of $136,039 in Uruguayan currency. San Paulo for the 41 weeks records an improvement of £146,380 and 5,862 contos.

* * * *

L.M.S.R. Employees at Night School

More than 14,000 employees of the L.M.S.R. will "go back to school" at the company's expense during the winter, and arrangements have been made for holding classes and lectures at 50 of the principal centres on the company's system in England, Scotland, Wales, and Northern Ireland. The curriculum includes block signalling, commercial subjects, and lectures on various aspects of the company's work. These railway students will not be required to pay fees nor to buy text books, and they will be provided with reasonable free travel between their homes and the instructional centre which they are attending. Already about 6,700 students have been enrolled for courses in goods and passenger station office working and block signalling, and some 1,100 for classes and lectures arranged with universities and local education authorities. Last year 7,000 attended lectures on railway subjects, and it is expected that lectures arranged for this year will be as well attended. In addition to this comprehensive educational programme, the L.M.S.R. promotes classes in ambulance work, which last year numbered no fewer than 370. They were attended by 8,266 employees, and of this total 8,040 were passed out as qualified to render first aid. An increase on this figure is confidently expected during the coming session. At the termination of every session, prizes and certificates are awarded by the company to successful candidates.

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Lessons in the Timetable

The station index to a timetable folder issued by the Canadian National Railways contains a variety of place names which repays study by others than intending travellers. Numerous boys' and girls' names suggest that the folder might find a place in schools, where, interest having been quickened by turning up such stations as Clarence, Felix, Amos, and Jasper; or Aggie, Salome, Janet, and Cecile; the opportunity could be taken to show their positions on a map and inculcate familiarity with the less common aspects of Canadian topography. There is also the novelty of "buried" names in Hemaruka—a compound of Helen, Margaret, Ruth, and Kathleen, the four daughters of the Vice-President of the C.N.R. Links with literature are found in stations named after such characters of poetry and drama as Galahad, Romeo, and Faust; or after celebrated men of letters such as Shakespeare, Shaw, Shelley, Emerson, Carlyle, and Kipling. As new stations are opened to serve districts hitherto unprovided with rail transport, the opportunity is taken to be topical in the choice of names. There are suggestions for many lessons in twentieth century history to be found in the timetables showing the train services of Bonar Law, Clemenceau, Kitchener, and Kerensky.

* * * *

Names to Conjure With

Regular travellers on British railways may regret that the names of our stations are in the main so much less allusive than those quoted in the preceding note. Even where we are not handicapped by having to call a station after some prosaic town or village, our selection seems to be less inspired than that exemplified in the Canadian timetables. Calvert, and Verney Junction may have interesting associations for the local people, but the appeal of Pine Orchard, Maple Grove, Moonbeam, and Paradise Hill must be classed as universal. Sometimes the station names have an added interest derived from the principle behind their choice. On the C.N.R. Redditt to Biggar line, for example, the names run in an alphabetical sequence, which unfortunately does not achieve complete regularity owing to its having been broken by the opening of new stations. However, from Arona it runs logically through Bloom, Caye, Deer, Exira, Firdale, Gregg, Harte, Ingelow, Justice, Knox, Levine, Myra, Norman, Oakner, Pope, Quadra, and Rea. There the sequence is broken, to be taken up again by Semans, Tate, Undora, Venn, Watrous, Xena, Young, and Zelma. On some lines Indian names occur, such as Wekusko, Sipiwesk, and Pikwitone. We wonder whether the Canadian ear finds equal interest in our own Irlams o' th' Height, or Newton Poppleford.

How to Achieve Speed Records!

Once the initial public fear of the potentialities of steam traction had been overcome, high-speed travel seems to have been regarded as one of the desiderata of railways. In his paper on " Transport in France," given to the Institute of Transport last Tuesday, Mr. F. J. Wymer referred to the recording of comparative railway speeds as long ago as 1848 in the *Annuoire Chaix,* and, incidentally, quoted that book as one of the finest examples of what could be done with figures. In a table showing the speeds of trains in various countries he observed with pride that the English trains all ran with greater rapidity than those of France, but admitted to some degree of surprise when he noted that the highest speed in the world appeared to be on the South Eastern Railway between London and Dover—99·885 km. an hour. It was still more surprising to see that the journey from London to Rugby—almost the same distance and covered in less time—gave a speed of only 64 km. an hour, while the L.B. & S.C.R. succeeded in running its omnibus trains at 63 km. an hour but its expresses at only 57. The explanation of this " Alice in Wonderland " performance was contained in a footnote which informed the reader that, for every stop the trains made, five minutes had been deducted! It followed that the more times the train stopped the faster it went, until, if it stopped often enough, it reached that mathematical goal where it arrived before it started.

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The Longest European Bridge

The claim that the Storstrøm bridge, the subject of an illustrated description in this issue, is the longest bridge in Europe appears to rest upon a comparison between it and the steelwork spans of the Tay bridge. On that basis the Storstrøm bridge wins, but if it is compared with the overall length of the Tay bridge, including the brick arched spans in the approaches, which in our opinion should legitimately be taken as part of the whole structure, then the Tay bridge has it by the handsome margin of well over 1,000 ft. We have it on the authority of Mr. W. A. Fraser, Engineer (Scotland), L.N.E.R., that the actual overall length of the Tay bridge from abutment to abutment, including the approaches, is 11,653 ft., of which the main steelwork spans account for 10,269 ft. The length of the Storstrøm bridge has been quoted with a good many variations, but the figure we have from a reliable source measures it at 10,537 ft. from abutment to abutment. When recording the opening of this bridge in our issue of October 1 we compared its length with the Tay bridge on the assumption that the latter was 10,527 ft. long as given by Mr. F. W. A. Handman in his paper on the Lower Zambezi bridge presented to the Institution of Civil Engineers on December 1, 1936, and referred to in our issue of April 23, 1937. How these variations of overall measurements arise may be accounted for in various ways, but it would be useful to have a standard system of bridge measurement if only to place international rivalry in such matters on a more reliable footing.

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Danish Train Ferries

The opening of the Storstrøm bridge, while it will facilitate communications between Copenhagen and Germany and between Zealand and Falster, will not have much effect otherwise on the admirably efficient system of sea transport by ferries which has done so much for the development of the country. There is only one bridge even now which connects the insular portion of Denmark with the mainland—the Little Belt bridge which joins Funen to Jutland. Over it the trains from Esbjerg to Copenhagen pass, but they have still to cross by ferry the wide stretch of the Great Belt from Nyborg to Korsør. Train ferries admirably handled, convey in bulk the agricultural produce from the islands. It is the practice to load the railway wagons, say in such a remote island as Langeland, convey them without breaking bulk by ferry from Rudkjøbing to Svendborg and then on to Esbjerg for shipment to England. This system of train ferries is now so well established as to be an integral part of the internal communications of Denmark. The punctuality of the ferry services is remarkable. They cross considerable stretches of sea, but they run in connection with carefully scheduled railway services.

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Train Unpunctuality in Germany

We have not infrequently referred in these columns to the high reputation of the German railways for the punctual running of their trains. On a recent visit, however, we noted a falling off, some of the trains by which we travelled being from a few minutes to as much as half an hour or more behind time. On one occasion, the arrangements we had made for the day were largely upset by the arrival of a train from Munich at Cologne 45 min. late, the result being that we missed a connection at Duisberg and found it necessary to vary the route previously mapped out. To some extent the disorganisation referred to appeared to result from the change from summer to winter schedules, and, in point of fact, on the first day of the change, the officials themselves did not always seem to know what the exact timings were. Consultations between the train attendants and the station officials followed the enquiries of passengers as to where, if at all, the latter had to change, and a certain amount of confusion was obvious in replying to certain other questions as well. We have not noticed anything of the kind on former occasions, and the present signs of temporary dislocation coincided somewhat unfortunately with a very considerable increase in the number of passengers travelling.

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Mothering the Traveller

No one can accuse London Transport of taking unholy joy in whisking the doubting passenger in and out of his destination station before he has time to recognise it. On the contrary, since its inception, the board has always regarded him as its own special chick and displayed considerable anxiety lest he should go astray. He has been experimented upon with station nameplates of every sort, size, and colour, some placed high, others low; some of paper, others of metal, and some even cunningly incorporated into the structure of seats. Should he desire to reach Earls Court, then Fiery Crosses urge him on his way from all parts of London. The latest inspiration of the board's fertile and never-sleeping brain may now be seen on the Northern Line at Tottenham Court Road station. Here the passenger, be he short or tall, standing or seated, cannot fail to see the name of the station. This is the result of supplementing the ordinary bullseye signs with a continuous frieze repeating the name of the station along each side of the station wall. Meeting with success, we understand that this innovation is to be extended throughout the Underground railway system. As the station now appears, he who asks " Is this Tottenham Court Road? " will, we suspect, be the subject of a forthcoming H. M. Bateman cartoon. Gratitude is due to London Transport for yet another step to assist in the evolution of the perfect passenger, whose eventual appearance will cause a sigh of pure bliss to arise from the dizzy tower of 55, Broadway.

Mr. Maunsell's Retirement

AS already announced in these columns, Mr. R. E. L. Maunsell is retiring from the position of Chief Mechanical Engineer of the Southern Railway on October 31. At the time of the grouping of British Railways in 1923, when he was appointed, the total locomotive stock of the constituent companies forming the Southern group amounted to 2,285 engines, made up of 115 classes; there are now 1,852 engines in service, made up of 77 classes, a reduction due partly to electrification, but also to a considerable extent to Mr. Maunsell's policy of standardisation and rationalisation. The introduction of the "Lord Nelson" class of express engines in 1926, for working the heaviest fast passenger services of the Southern Railway, was received with much interest in locomotive circles, and but for circumstances connected with permissible axle loadings, the engines of this series would have been ever more powerful than actually was the case. That notwithstanding, the class has shown to great advantage, and this may be attributed in part to the special arrangement of the crank angles, the result of which is to give eight beats in place of the customary four for each revolution of the driving wheels, thus providing an improved torque and exercising a beneficial effect upon the boiler draught. These and the "King Arthur" class locomotives rank amongst the most efficient of any designed and built for express passenger service on British railways, and both are noteworthy for the clean and symmetrical appearance they present.

Mr. Maunsell has favoured the 3-cylinder single-expansion principle in fair measure, having designed and built several classes incorporating this feature; he has also succeeded in showing that the 4-4-0 type built with three cylinders, a large boiler carrying a high pressure, and a medium sized coupled wheel, can still be made effective, and perform a most useful function in hauling fast passenger trains other than those of the heaviest loadings on a British main line. We consider the "Schools" class engines built to this specification to be one of the best looking and most successful engines turned out during recent years in Great Britain. There has been a fair amount of rebuilding of locomotives during Mr. Maunsell's time as Chief Mechanical Engineer, a noteworthy case being the conversion of the Billinton "Baltic" tank engines of the former L.B. & S.C.R.—which, on the electrification of the line to Brighton, were left as it were without a suitable job—into 4-6-0 express engines with tenders, the "Remembrance" class. As rebuilt, they fill a very useful place in the company's locomotive stock. Of interest, also, is the fitting of one of the "Lord Nelson" engines with a new type of boiler having a combustion chamber, and in which the superheater and evaporative heating surfaces were re-arranged.

In connection with extensions of electrification on the Southern Railway, Mr. Maunsell has been responsible for the design of the rolling stock, and it is to him that credit is due for the introduction of arm rests in third class carriages. Indeed, it might be said that Mr. Maunsell was the pioneer in the great improvement in third class accommodation which has marked British railway development in the last few years. To him also is due the introduction as a standard feature on Southern main line rolling stock of the buck-eye coupler and Pullman type vestibule. Apart from the foregoing, Mr. Maunsell has achieved much good work in connection with reorganising some of the different locomotive and carriage works of the company, and has, generally speaking, pursued a vigorous policy which has left the Southern Railway Company's mechanical department in a highly satisfactory condition, upon which he can look back in his retirement with justifiable satisfaction. We take this opportunity of expressing our sincere wish that Mr. Maunsell may enjoy many years of well-earned relaxation from the duties of the responsible office that he has occupied during the past 14 years.

* * * *

South Indian Railway

THERE were no lines under construction by the South Indian Railway Company during the financial year ended March 31, 1937, for which we have received the report, and the length of line worked by the company on behalf of the Government of India was the same as at the close of the previous year. The length so worked was 2,233¼ miles, of which 599 miles were of 5 ft. 6 in. gauge, 1,535¼ of metre gauge, and 99 of narrow gauge. In addition, the company worked for other owners the following metre gauge lines:—Pondicheri Railway (Pondicheri Railway Company) 8 miles; Karaikkal Railway (French Government) 15 miles; Travancore Railway (partly owned by the Government of India and partly by the Travancore State) 148 miles; Coimbatore District Board Railway 25 miles; and Tinnevelly District Board Railway 38 miles. It also worked on behalf of the Cochin State the broad gauge Shoranur-Cochin Railway of 65 miles. Open line capital outlay during the year, including suspense, amounted to Rs. 20,17,859, of which engineering works absorbed Rs. 13,74,197. These included remodelling of Shoranur and Coimbatore, power signalling at Madura junction, extension of loops at several stations with interlocking arrangements, and replacement of wooden sleepers with steel transverse sleepers on the Virudhunagar-Tenkasi Railway. Capital outlay on rolling stock amounted to Rs. 5,62,672.

Gross earnings for the year under review showed a net increase of Rs. 14,03,264 or 2·92 per cent., and in working expenses there was a net advance of Rs. 1,29,358 or 0·43 per cent., so that net earnings were higher by Rs. 12,73,906 or 7·12 per cent. The company's share of surplus profits remitted to London amounted to Rs. 70,282, realising £5,299, as compared with Rs. 13,126 and £990 for 1935-36. To stockholders the total distribution for the year is 4¾ per cent. (1¼ per cent. from surplus profits and 3½ per cent. from guaranteed interest) as against a total of 5½ per cent. for 1935-36. The accompanying table compares some operating figures:—

	1936–37	1935–36
Passengers carried	48,211,047	47,186,837
Public goods traffic, tons	3,080,319	2,933,501
,, ,, ,, ton-miles	396,269,909	364,864,532
Average haul, miles	129	124
Operating ratio, per cent.	61·26	62·78
	Rs.	Rs.
Passenger receipts	1,93,18,304	1,97,77,990
Public goods receipts	2,43,69,938	2,27,99,735
Gross earnings	4,95,00,642	4,80,97,378
Expenses	3,03,24,732	3,01,95,374
Net receipts	1,91,75,910	1,79,02,004

In third class traffic which contributed 99 per cent. of the total number of passengers carried and 92 per cent. of passenger earnings there was an increase of 2·25 per cent. in numbers, but a fall of 3·04 per cent. in receipts. Earnings from the first and the other classes improved, but numbers in the second class were lower. Parcels receipts (Rs. 16,39,764) were Rs. 45,463 lower. Earnings from public goods traffic were higher by Rs. 15,70,203 or 6·88 per cent., with an increase in quantity of 46,818 tons or 1·60 per cent. The increased receipts come principally from oil seeds and general merchandise, but there were decreases under rice and other grains. On account of renewals and replacements of permanent way,

works, and rolling stock the sum of Rs. 42,35,110 was expended during the year under review, as against Rs. 39,90,047 in the previous year. There was a decrease of Rs. 1,15,705 under ordinary working expenses.

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Buenos Ayres Great Southern Railway

DUE to rising prices for cereals and the increased prosperity of the country, gross receipts of the Buenos Ayres Great Southern Railway in the financial year ended June 30 last increased by 12,259,234 pesos (equivalent to £1,070,251 at par), and net receipts showed an increase of 11,259,780 pesos (£982,997 at par). But exchange differences required £1,297,822, or £123,840 more than in the previous year. The special concession whereby the company was enabled to make its remittances at 5 per cent. above the official buying rate of $15 to the £ expired on December 31, 1936, and since January 1, 1937, the company has been making its remittances at $16 to the £. Since the official depreciation of the peso in 1934 the average annual loss to the company on exchange has amounted to £1,368,065. Without these losses both preference stocks would have had their dividends in full each year, amounting to £880,000, and something would have been left for the ordinary. The board expresses the hope that the Argentine Government in its desire to improve the position of the railway industry will grant alleviation of this heavy burden and that the extent of the benefit which Argentine producers have received by exchange control and the loss suffered by the railways, upon whose services the producers are so largely dependent, will be recognised. After meeting all prior charges there is a balance available for preference dividends of £660,829. The full dividend on the 5 per cent. preference stock takes £400,000, and the 3 per cent. dividend on the 6 per cent. preference takes £240,000, leaving £20,829 to be carried forward.

Mr. C. R. S. Harris, the Director General, in his report explains that about one third of the increase in traffic receipts was due to the improvement of the fine grain harvest (wheat, oats, barley, linseed, and rye). Receipts from passengers and parcels benefited by the general rise in prosperity, and revenue from these sources was approximately £314,000 more. A reduction of suburban fares in the middle of last December brought back a considerable volume of traffic to the railway and by the end of June an increase of nearly £50,000 in suburban passenger revenue was secured. Main line passenger revenue improved by £111,780, the summer tourist traffic to Mar del Plata being especially noticeable. The increase of £124,287, or 14·66 per cent., in parcels revenue was due especially to the growth of the fruit traffic from the Rio Negro valley. Public goods traffic tonnage increased by 19·68 per cent., and the receipts therefrom by 15·51 per cent. Some operating figures are compared herewith:—

	1936–37	1935–36
Number of passengers	51,568,095	48,726,138
Tons of goods	8,500,691	7,102,753
Ton-kilometres, goods	2,161,754,918	1,911,232,121
Average haul, goods and livestock	250·58 km.	264·79 km.
Train-kilometres	24,294,160	22,494,858
	£	£
Passenger receipts	2,699,076	2,509,197
Goods receipts	5,565,743	4,818,447
Gross receipts	10,992,266	9,922,015
Working expenses	7,328,847	7,241,593
Net receipts	3,663,419	2,680,422

The decrease in the average haul appears to indicate that the company's efforts to recapture short-distance traffic from the road have met with some success. The very heavy additional traffic was moved with an increase of only £87,254 in working expenses.

Co-ordination of Goods Transport

THE Transport Advisory Council's report* on Service and Rates enunciates certain very important principles in connection with the steps which are being taken to secure the co-ordination of goods transport. It will be recalled that, after a recommendation made by the Royal Commission on Transport in 1931, Section 46 of the Road and Rail Traffic Act, 1933, enacted that a Transport Advisory Council should be constituted for the purpose of giving advice and assistance to the Minister of Transport in connection with the discharge of his functions in relation to the means of, and facilities for, transport, and their co-ordination, improvement, and development. The council comprises twenty-eight members under the chairmanship of the Rt. Hon. Sir Arthur Griffith-Boscawen, and its influential nature can be judged from the fact that the railways were represented by Sir James Milne, Sir Josiah Stamp, and Sir Ralph Wedgwood; the users of mechanically propelled vehicles by Sir James Adam, Sir John McDonald, Mr. Sidney E. Garcke, and others; while members also represented the interests of canals, coastwise shipping, docks and harbours, labour, local authorities, the users of horse drawn vehicles, pedestrians, and pedal cyclists. In December, 1935, the council appointed a committee of investigation from its members to consider the question of service and rates in relation to goods traffic borne by rail, canal, road, and coastwise shipping, beginning with the road transport industry. This committee was assisted in its work by comprehensive memoranda furnished by the national transport associations. Following consideration of the views of these organisations, the committee reached the following general conclusions: (1) that, with a view to avoiding unnecessary overlapping of services and uneconomic competition, it is desirable to establish as great a degree of co-ordination as possible among the various forms of goods transport: (2) that the best line of approach is to aim at securing for traders adequate alternative facilities, care being taken that the resultant competition is on fair terms; and (3) that there should be an unfettered right on the part of the trader to select the form of transport most convenient and economic for his purposes.

The committee enlarges these conclusions by expressing the view that any attempt to dictate services and to endeavour to decide that certain goods should go by certain forms of transport would be impracticable and certainly not tolerated by public opinion. It also holds the opinion that where practicable all forms of transport should be rate-controlled, with publication and non-discrimination, in order to ensure a fair basis of competition. It therefore proceeds on the assumption that if the rates charged are stabilised within each form of transport and voluntary agreements are then concluded between the various forms of transport, the greatest possible degree of co-ordination will be secured, since each form of transport will tend to carry those traffics to which it is best suited. These principles will, we imagine, meet with general approval, and on this basis the committee first investigated the possibility of co-ordinating road transport rates and set up a special road and rail sub-committee for this purpose. This sub-committee's report was adopted by the full council on July 22 last and expresses the view that the institution of a Central Rates Tribunal dealing with the rates of all forms of transport would be premature at present but that substantial agreement could be reached: (i) that the internal organisation of the road transport industry must be regarded as an essential preliminary to

* Ministry of Transport: Transport Advisory Council Report on Services and Rates. Published by H.M. Stationery Office, price 1s., 60 pp.

further progress; and (ii) that the stabilisation of wages, working conditions, and rates within the road transport industry requires to be dealt with before serious progress can be made in its relations to other forms of transport.

As regards (ii), the sub-committee feels that no real co-ordination can be effected between road and rail until the regulatory machinery recommended by the Baillie Committee on May 4, 1937, becomes effective, and it urges that the legislature should deal with this matter at the earliest possible moment. So far as rates are concerned, the sub-committee considers that opportunity must be afforded road hauliers to build up a rates structure for their own industry. These rates, it suggests, should be fixed in relation solely to factors affecting the road industry rather than by attempting to relate them to rates charged by other forms of transport. It feels, however, that the road rates structure as a whole should be elastic and capable of adjustment by simple and quick procedure, but there should be suitable machinery for the enforcement of the agreed road rates as between road operators themselves. To achieve these objects the sub-committee recommends that regional area rates committees should be established, representative of the road transport industry; that these committees should fix minimum rates; that these rates should be submitted for approval or modification to area rates officers, appointed by the Government to control areas corresponding with the existing Traffic Commissioners' areas; and that a national road rates appeal tribunal should be set up.

It is also recommended that these rates should be published, steps taken to prevent discrimination or undue preference, and that it should be made a condition of a licence that a haulier should convey traffic only at the published rates. The sub-committee also agreed that as early as practicable conferences should be held between the road and rail interests, either centrally or in the various areas, for the purpose of reaching voluntary agreements upon rates. These agreements, it is suggested, should be terminable at short notice and then lapse until replaced by new agreements. The sub-committee recognises that these proposals are of a very general character and require very detailed investigation, but they indicate the steps which it is considered are most likely to lead to progress towards a solution of the problem. The report also shows that both rail and road interests had endeavoured to reach a real measure of co-operation and records that, subject to certain conditions, the railway members felt that a very substantial measure of agreement could be reached with the road interests on certain licensing matters raised by the latter in regard to the working of the 1933 Act. The approval of this report by the full council marks an important stage in the work, and legislative action is now an essential preliminary to any further extensive progress towards co-ordination.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Timetable Reorganisation

34, Evington Drive, Leicester, October 6

To the Editor of The Railway Gazette

Sir,—"Vitesse," in your issue of October 1, pays the G.C.R. section of the L.N.E.R. a very high compliment when he says that, with present loads, 105 min. for the 103 miles between Leicester and London would be easy or not difficult. The mountainous character of the line is sufficiently well known to need mere mention, and, of course, this section has always been characterised by the extreme tightness of its schedules. I have yet to see Midland station work as smart as that to be seen every day at Leicester Central at 5.9 p.m. Loads used to be light but it is not unusual for the 3.20 p.m. ex Marylebone to carry 10 standard coaches (9 L.N.E.R. and 1 L.M.S.R.). Recently it arrived 2 min. early with 12 coaches and actually picked up another, making 13 to Nottingham. It is true that with a "Sandringham" it was early, but it is surely ungenerous to take that for granted and easy, and to demand yet more! If the 3.20 p.m. is accelerated, all honour will be due for a really magnificent performance.

I was glad to see the recent L.M.S.R. acceleration. From the position of bottom which the Midland section has had for nearly 20 years in *The Railway Magazine* tables, this will be a great improvement. It was depressing to see important L.M.S. trains often arriving at Leicester several min. late and then sometimes over-staying a station allowance of 6 min. or so. Compared with the brisk, businesslike way all is done in a meagre two min. at Leicester Central, it was indeed slow work. Let us not forget years of excellence.

Yours,

H. M. LACEY

10s. Worth in East Anglia

The Railway Club, E.C.4. October 13

To the Editor of The Railway Gazette

Sir,—The introduction of the East Anglian tempted me to a trip on the first down run as far as Ipswich, where I purchased one of the well known 10s. season tickets, and some account of my experiences may be of interest.

As far as the East Anglian itself was concerned travelling was luxurious but uneventful, the customary service slacks being observed with more than usual severity. This however gave the interested spectators *en route* a better chance of seeing the streamlined "Sandringham" locomotive. Let us hope that it will be speeded up to give the streamlining some useful purpose.

I chose area No. 3 for my ten shillings worth, which takes in Haverhill, Bury, Ipswich, Marks Tey and the branches to Aldburgh, Felixstowe, Harwich and Clacton. I should like to congratulate the L.N.E.R. on the standard of comfort available on all branches, and on the ease of getting about (with one exception). I travelled in up-to-date corridor stock in all cases, very often in solitary glory, and occasionally had the use of the latest buffet cars, which are excellent. I found it best to sleep at Clacton, whence I travelled each morning (save the first and last when I stopped at Ipswich), but I would suggest that the railway company work out a couple of tours for each area detailing places of interest, train times, and sleeping accommodation—the holiday handbooks are too cumbersome. My total mileage for 10s. was 570.

I referred above to an exception regarding ease of travel. It is not possible to leave Clacton on Sunday (by train) between 9.5 a.m. and 5.4 p.m., which of course rendered touring practically impossible on that day. I do not complain about it—I merely express surprise. It was the only inconvenience encountered in a most enjoyable week.

Yours faithfully,

D. W. O'DWYER

60-m.p.h. Trains to Birmingham

With reference to the Rev. W. A. E. Westall's letter under the above heading, published in our issue of October 8, whilst it may be true that there are no technical reasons why trains could not be run between London and Birmingham in 105 minutes, we understand that owing to the configuration of the Great Western line, which necessitates eleven permanent restrictions of speed in each direction, this could be done only by sacrificing the present standard of comfortable riding, which would not be in the interests of the travelling public.—Ed. *R.G.*

PUBLICATIONS RECEIVED

Railway Rates in Relation to Trade and Industry in India. By R. D. Tiwari. London: Longmans Green & Co. Ltd., 39, Paternoster Row, E.C.4; also at Calcutta, Bombay, and Madras. 8¾ in. × 5½ in. × 1 in. 333 pp. Price 10s. 6d. net.—This work was submitted in its original form as a thesis for the M.A. degree at Bombay University, and the author is Professor of Economics at the M.T.B. College, Surat. It presents an academic view of the Indian railway rates question, but contains much that will be contested by practical railwaymen. The book, however, fills a gap in the sparse literature on the subject, and in it is concentrated a mass of valuable information, even if much of it is obscured by an excess of detail. The theme is a genuine attempt to co-ordinate railway charges with the needs of industry, and it is unfortunate that, in his attack on what he considers the individualistic policy of the railways, the author fails to conceal his prejudices. His Utopian remedy for existing methods is a concerted national control and co-ordination of rates, which, though it might be suitable in a normal homogeneous State, is unlikely to prove feasible in a vast sub-continent with extraordinarily widely varying conditions.

Modern Railway Practice Facilities and Charges. By L. A. Carey. London: Industrial Transport Publications Limited, Dudley House, Southampton Street, W.C.2. 8¾ in. × 5½ in. × 1 in. 176 pp. Price 7s. 6d. net.—This book fully justifies its claim to be a practical text-book, written from the industrial standpoint, for all who send or receive goods by rail. Intended primarily as a guide to firms who do not employ traffic specialists, it is sure also to interest railway traffic officers and railway students. We know of no other text-book which gives such a variety of information in such a handy form and at such a moderate price on the subject of railway charges for goods and parcels traffic. History is included so far as is necessary to explain present practice, and the latest developments, such as the change in freight rebates consequent on reduced railway rating assessments, and the recent sanction by the Railway Rates Tribunal of a general 5 per cent. increase in railway charges are duly recorded. In the first chapter advice is given as to the lay-out and design of works and private sidings; the second and third chapters deal with the forwarding of traffic and explain packing, the standard conditions of traffic, and its forwarding, with subheads on mixed consignments, routing, &c. Classification of goods is the subject of Chapter 4, and is thoroughly and concisely treated. Standard and exceptional rates, and the standard scales for small parcels are explained in the next three chapters. In the chapters on cartage and collection and delivery there is information difficult to come by otherwise without a good deal of trouble and research, and the subject of agreed charges is well handled in Chapter 10. Rebates; registered transits, C.O.D. service, and containers; stoppage in transitu; demurrage; claims; dangerous goods; merchandise by passenger train; private owners' wagons; and the Railway Rates Tribunal are the subject of later chapters. The problem of rates with Ireland is one of particular difficulty because of the different classifications prevailing on the Great Southern Railways and on the railways of Northern Ireland, both of which differ from the British classification. Chapter 20 explains the scheme evolved for dealing with the problem, and also with the rates for traffic with the Isle of Man.

The Welding and Riveting of Aluminium.—We have received from the Northern Aluminium Co. Ltd., of Banbury, a well produced and readably written booklet on the welding and riveting of aluminium. Such rapid progress has of late been made in the applications of aluminium that railway engineers, who find it difficult to keep abreast of all the latest practical developments, will welcome this publication. As it is pointed out, the welding of aluminium nowadays presents no difficulties provided the correct technique and good quality materials are used. Practical instructions are laid down for the various processes. The welding of aluminium and its alloys may be divided into three main classifications: (1) Fusion or autogenous welding using oxy-acetylene or oxy-hydrogen flames; (2) electric-arc fusion welding, including the metallic arc, carbon arc and atomic hydrogen arc welding processes; (3) electric resistance welding, including butt, spot and seam welding. Practical details of materials and equipment are given, including the important subject of the choice of the correct welding rod or wire, the adjustment of welding flames, pre-heating, and indeed every aspect of practical welding. The latter part of the booklet is devoted to an exposition of the design of riveted joints, and the practical methods of application. Tables of the mechanical properties of aluminium and welded and riveted in joints, &c., conclude this very useful production.

L.M.S.R. Colliery List.—We have received from the Chief Commercial Manager's Office, L.M.S.R., Euston House, N.W.1, a copy of the official list of collieries upon the company's system or upon lines in connection therewith (Scotland excepted). In this publication are listed the invoicing stations, names of proprietors, and postal addresses of every colliery; 15 area maps indicate the positions of the collieries in relation to the L.M.S.R. lines. To correspond with every colliery area—South Yorkshire, Leicestershire, Derbyshire and Nottinghamshire, &c.—the list has been divided into sections wherein the collieries are set out in alphabetical order. Names and addresses of the various coal-selling agencies are appended, and an index to the lists is provided. This publication is invaluable to coal factors and others having direct dealings with the collieries.

Electrodes.—We have received from the Murex Welding Processes Limited, of Ferry Lane Works, Forest Road, London, E.17, an illustrated folder describing the nature and advantages of Cresta electrodes, which are claimed to be the nearest approach to the ideal general-purpose electrode. Other assets are good mechanical properties, a high rate of deposition, ease of slag removal, adaptability for hot forging operations, and suitability for d.c. and a.c. operation over a wide range of generator characteristics. Data of results obtained from tests are given, and notes on operation. Tables for designing and estimating are appended.

G.W.R. Jig-Saw Puzzles.—The piecing together of jig-saw puzzles is an absorbing pastime, stimulating for the brain worker and a restful change for those who follow outdoor occupations. According to the latest list we have received, there are now available 13 different puzzles in the series issued by the G.W.R., every one of which makes a picture in full colour. A feature of the current patterns is the packing, each puzzle being housed in an attractive book box which when closed can be placed on the bookshelf showing the title as with an ordinary volume. The puzzles are in two sizes, priced 2s. 6d. and 5s. respectively. Indication of the popularity of these puzzles is the fact that over 750,000 have been sold during the last 12 years. A list may be obtained from the Stationery Superintendent, Paddington Station, W.2.

Corrosion Resisting Steels.—We have received from Hadfields Limited, of Sheffield, an illustrated catalogue setting forth the advantages and uses of Ena non-corroding steels. To meet various special chemical and mechanical requirements, this steel is made in five types. Tables of some of the chemical agents to which they are completely resistant are given and also particulars of their mechanical and physical properties. Details of their working characteristics are furnished. On the back cover of the catalogue are particulars of the forms in which these steels are available. We have also received a photograph of a ship's bell made throughout of Ena non-corroding steel, and presented by Sir Robert Hadfield on behalf of Hadfields Limited, of which company he is chairman, to the new war vessel, H.M.S. *Sheffield*. This bell is a beautiful work of art and a perfect example of founder's skill. It weighs 2½ cwt., has the City of Sheffield coat of arms, cast in relief, mounted on each side of the gallery, and has the ship's name and the date engraved on the outside.

THE SCRAP HEAP

FOG
RAIL CHAOS
ROAD DEATHS

Newspaper placard seen in London on Monday. Could the railways have a better, if involuntary, bouquet?

* * *

STATION MOVED BY RAIL

According to the *Canadian Pacific Staff Bulletin*, the C.P.R. station at Loyalist, Alberta, a two-storey building out of use for the past three years, has been moved by rail to Castor, where, reconditioned, it will replace the station burned in June of this year. Loading of the building on a flat wagon and anchoring it safely for the trip of some 50 miles took several days. In order to make the move it was necessary to have all whistle posts and other small obstructions along the line taken down, as the building projected 9 ft. over each side of the car. Short side tracks were also laid around the water tanks to avoid hitting them.

* * *

IN AMERICA

A harassed traffic manager remarked somewhat testily to his chief assistant that he did not know which of the two evils he was confronted with at the moment was really the worse, a cross rail-road complainer, or a lost road-rail container. Finding the container would, of course, to some extent compensate for the possible loss of the complainer. (The latter had threatened to remove his patronage to another "road.")

* * *

"He [Grey] never complained of the beloved N.E.R. as being too near; the sound of the trains close at hand through the wood was one of the old 'Fallodon noises' and as such 'homey' and 'liked.' Where the road crosses the railway line there is a signal box, behind which it was his roguish pleasure to take his stand with a guest close up against the gate, when the Scotch Express was due, to see the guest 'jump' as the giant in his speed rushed out from behind the signal box, scarcely a yard away. He never tired of this game; in one of the last years of Grey's life, a distinguished visitor was astonished at being hurried away from a visit to Bamborough Castle and motored back in haste to Fallodon, in his host's anxiety not to miss the Scotch Express.—*W. M. Trevelyan in "Grey of Fallodon."*

* * *

The Swedish State Railways are the leading landscape gardeners of the country, every station and flagging-point on its 4,500 miles of line having a setting of gardens and shrubs; passage ways are lined with vivid flower-boxes and hanging potted plants. And there is no billboard advertising along the tracks. . . . It all started in 1862, when Olof Eneroth, an obscure State horticultural director, revolted at the ugliness of the advancing railway lines, and in one decade laid the foundations of today's beauty.—*Alma Louise Olson in "The American Swedish Monthly."*

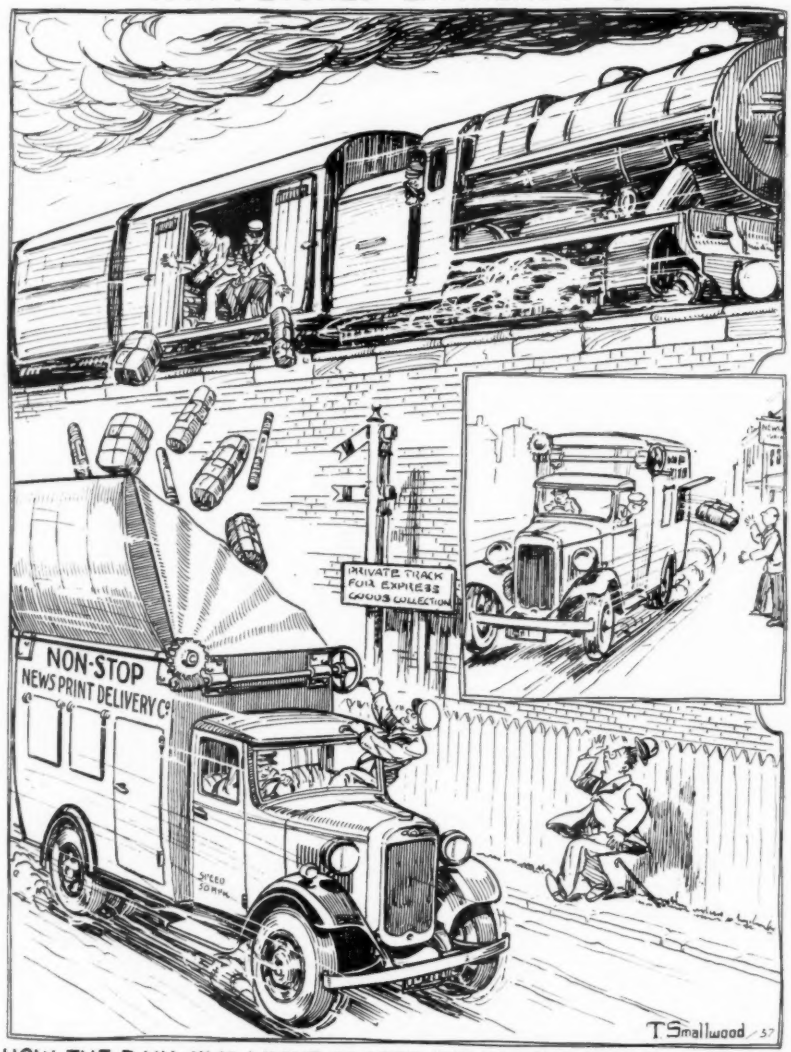
* * *

We advocate a change in the system of issuing railway tickets only at the stations, and protest against their being marked with the date of issue, which renders them useless after a certain period has elapsed. There is no reason why railway tickets should not be sold like stamps. They ought at least to be procured in the chief thoroughfares of every town. This is the case in the U.S.A., where a man never thinks of waiting for his ticket till he gets to the railway station. The dating of tickets is an oppressive restriction, and when one has paid a fare to Brighton it ought to be a matter of indifference to the railway company whether the return journey is made on a Friday or a Saturday.—*From the "Globe" of April 26, 1873.*

* * *

The French State Railways have created a "de luxe hobo" class of travel, offering tickets for boxcars on any freight train anywhere in France. Several hundred cars, painted white inside and out, and fitted with cook-stoves and hooks for hammocks, will be used as "tramping-camping" cars, with a fare of 18 francs (about $1.35) a day. They will be "rented" to hobo parties of at least six and not more than ten a car, regardless of sex. —*From the New York "Herald Tribune."*

FAR-FETCHED EFFICIENCY (5)



HOW THE RAILWAYS MIGHT CO-OPERATE IN NON-STOP TRANSPORT

"Co-ordination of Goods Transport" as depicted in a recent issue of "Transport Efficiency: The Morris-Commercial Magazine"

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

NEW ZEALAND

Traffic Increase Continued

During the year ended March 31, 1937, there were 21,235,428 passenger journeys by train, an increase of 876,904 on the number of passengers carried in the previous year, and goods tonnage amounted to 6,813,240 tons, an increase of 624,435 upon the tonnage carried in the previous year. Indications so far for the present financial year are that this improvement is being continued.

A good record was established by the Railway Department's road services which, during last financial year, carried 4,556,316 passengers, an increase of 1,313,847 over the figures for the previous year. Certain additional services were taken over and operated during the year by the department.

These indications of continued improvement, states the Minister of Railways, give every encouragement to the Government in its railway development policy, and furnish a further reason for adopting the department's £3,000,000 programme of new works, renewals and replacements, for the current financial year.

North Island Major Works Programme

Included in this programme are the following major works required for necessary improvements in the North Island:—

	£
Horotiu–Papakura, doubling to complete the deviation of the Auckland – Frankton junction section	180,000
Turakina–Okoia deviation and Wellington station buildings and yard	139,000
New wagons and improvements to existing wagon stock	347,840
Provision of 12 multiple-unit coaches for Wellington–Johnsonville line	107,500

Other large items of expenditure in which the North Island would participate include £110,000 for bridge strengthening and £41,000 for passenger cars, in addition to which there is a sum of £90,000 for locomotives, including 20 new class "K" engines for the North Island. There are also track renewals to cost £230,000 and an amount of £118,716 for workshops, buildings, and plant.

Staff Notes

Recent additions to the staff of the Government Railways have increased the number of employees to more than 21,000. With a view to bringing the conditions of the department's staff of female office assistants into line with present-day standards, an improved wages scale has been introduced, with retrospective effect from January 1st last.

A gratifying outcome of the increasing business handled by the railways has been the promotion of employment within the department. During the first quarter of the current financial year, 550 additional employees have been engaged. The steady growth of the department's activities has necessitated a review of the permanent establishment, and arrangements are now in train which will result in about 500 casual employees with long service being absorbed into the permanent staff.

Farm Transport "En Masse"

A special goods train comprising 35 cattle trucks and six wagons was used recently to transfer the stock and equipment of a 230-acre Taranaki farm to the Bay of Plenty district. Actually, the train was made up at Mokoia station of 26 cattle rakes and nine specially fitted pigsties. Five lorries were used in the transportation of the cattle and pigs, operations commencing at 7 o'clock and continuing throughout the morning. By 11 o'clock the Mokoia yards presented a lively appearance with 300 head of cattle penned, 20 sheep in a small flock, and upwards of 60 pigs in sties and wagons. Loading proceeded smoothly and the stock was entrained by one o'clock. An additional 40 heifers were to be picked up at Eltham. Two drovers with dogs accompanied the cattle. Six wagons of household effects and equipment were also dispatched. The whole consignment—the farmer's 28-years' accumulation of stock and equipment—landed safely at its destination, 300 miles away, the following day.

Completion of Napier-Wairoa Railway

On June 30 the last rivet was hammered on the Mohaka viaduct, the last spike was driven on the Napier-Wairoa (70-mile) section of the North Island East Coast line, and the first through vehicle from Wellington (270 miles), a Wairarapa 49-seater railcar, reached Wairoa with the official party, following the opening of the viaduct for traffic. Since then traffic on the new section has been worked by the Public Works Department, although the Railway Department is to take over the line at an early date.

In order that the residents of the districts served by this or other new lines may reap the full benefits of them at the earliest possible opportunity, through rates and fares will be charged from the time through traffic can be worked between them and existing lines, the whole distance for charges being treated as one unit. This arrangement will give the full benefit of low railway transport rates for the longer distances on fertilisers, livestock, and other requirements, and the products of producers and consumers in the new country opened up, right from the inception of through railway connection between their districts and the country previously served by the railways.

Already the primary producers of the Poverty Bay districts have benefited. The first 100-ton consignment of fertilisers reached Wairoa on August 10, and the price to farmers was £1 a ton lower than they had been paying when only road transport was available.

ARGENTINA

Proposed Transfer of Terminal Station

The *Intendente* (Lord Mayor) of the City of Mendoza has sent a note to the Ministry of Industry and Public Works of that province, suggesting that, as part of the scheme for reconstructing the Transandine Railway, the State Railways administration be requested to have the old terminal station of that line in Mendoza demolished, and a new central station constructed at the point of junction of the Transandine Railway and the new Pie de Palo-Mendoza branch of the State Railways, for the joint use of the two metre-gauge lines. The note points out that the present position of the Transandine terminal station is an obstacle to urban development, and that the area occupied by the station yard, covering some 25 acres, could be converted into a public park. It is stated that such an arrangement would not interfere with the Transandine passenger or goods services.

Institution of Mechanical Engineers, River Plate Branch

At a meeting of the above branch, held in Buenos Aires on September 7, Mr. J. G. Mayne, M.I.Mech.E., Managing Director, Percy Grant & Company, read a paper on "The application of roller bearings to steam, electric and diesel locomotives." Mr. W. C. R. Livesey, Chairman of the branch, presided. Mr. Mayne reviewed the development of roller bearings, with a description of their application to locomotives in different parts of the world, including Great Britain, the U.S.A., and Europe, and their advantages as regards reliability, reduced maintenance costs, increased comfort for passengers and availability of engines, owing to fewer breakdowns. The paper was illustrated by lantern slides and cinematograph films, including one showing the turbine locomotive of the L.M.S.R., the first British locomotive to be fitted with roller bearings to all axles.

Grain Sowings: First Official Estimate

The first official estimate of the area sown with cereals and linseed for the 1937-38 season, issued by the Ministry of Agriculture, puts this at 12,595,000 hectares (31,487,500 acres) 491,500 hectares (1,228,750 acres) or 3·8 per cent. less than in 1936-37. The total is also 6·7 per cent. below the average for the last 10 years. The area sown with linseed shows a reduction of 460,000 hectares (1,150,000 acres), equivalent

to 15·3 per cent., as compared with last year, and is about 428,816 hectares (1,072,040 acres), or 14·4 per cent., below the average for the last 10 years. The estimated wheat sowings show an increase of 37,000 hectares (92,500 acres) over last year. The official estimates of the areas sown with the four principal crops are as follow:—

	Hectares	Acres
Wheat... ...	7,120,000	17,800,000
Linseed ...	2,550,000	6,375,000
Oats	1,260,000	3,150,000
Barley... ...	775,000	1,937,500

INDIA

Wedgwood Report Discussed in Upper House

On September 23, the Council of State adopted the official resolution on the Wedgwood Report requesting the Government of India to consider the report in the light of the discussions in the Upper House. Sir Guthrie Russell, Chief Commissioner of Railways, moved the resolution and Sir Sultan Ahmed, the Railway Member, wound up the debate. Divergent views were expressed by the non-official speakers. One speaker thought that the unanimous recommendations of the Public Accounts Committee, which found considerable support in the Lower House, should be upheld. Another school of thought supported the Government resolution, on the ground that the recommendations of experts in railway working and management deserved the most careful consideration.

Recruitment of Staff

Sir Guthrie Russell's speech dealt at length with the question of recruitment of staff for the railway services, as some of the recommendations of the Wedgwood Committee had been misunderstood. He asserted that there had been no reversal of the declared policy of progressive Indianisation of the railway services. The Wedgwood Committee recommended the importation from Great Britain of (1) a few senior officers for the commercial departments of the railways; (2) subordinate supervisory staff for the railway workshops (3) a Statistical Officer for the Railway Board; and (4) a Press Liaison Officer. The Railway Board agreed with the recommendations on items (2) and (3). There was no doubt, he said, that if the railway workshops were to function with full efficiency, a certain number of supervisory subordinates must be recruited from abroad. At the same time, the Railway Board had under consideration the improvement of the existing methods of training apprentices with the object of removing the present deficiency of adequate subordinate supervisory staff. In regard to the post of Statistical Officer, Sir Guthrie stated that the interpretation of railway statistics was really a science, and required years of study. To the best of the knowledge of the authorities, an officer with such experience was not available in India. It was, therefore, proposed that a Statistical Officer from abroad should be appointed for two or three years only, during which period he would be required, as a part of his duties, to train officers from Indian railways to take his place.

Though the Railway Board agreed with the Wedgwood Committee that the commercial departments of the Indian railways had to be strengthened, they were confident that the senior officers at present on the railways were competent to carry out the re-organisation by an increase in the number of officers in the junior ranks who would mainly be recruited in India, and that only in exceptional cases would it be necessary to recruit specialist officers from abroad. It was also likely that a suitable candidate for the post of Press Liaison Officer would be found in India.

Continued Financial Improvement

After assuring the House that the Government of India had no intention of departing from its policy of progressive Indianisation, Sir Sultan Ahmed turned to the recommendation of the committee on the disposal of railway surplus, which, incidentally, had come in for vigorous public criticism. Reviewing Indian railway finances, the Railway Member showed that a deficit of Rs 3·99 crores in the year 1935-36 was transformed in the following year into a surplus of Rs. 1·20 crores. There was, therefore, a net improvement of Rs 5·19 crores. Subsequently the position had further improved, as the gross earnings of State-owned railways up to September 10, 1937, exceeded the corresponding figures of 1936-37 by Rs 3 crores. There was also a small decline in working expenses. Up to September 10, therefore, the improvement in the financial position of the railways since the report of the Public Accounts Committee of July, 1936, was well over Rs. 8 crores, and if there was no deterioration, the year would close with a substantial surplus. Sir Sultan Ahmed asked how these surpluses were to be allocated, to the general revenues or to the Railway Reserve Fund? The railways would naturally urge the building up of a reserve fund to meet deficits in lean years. He assured the House, however, that the amounts payable to the Provinces under the Niemeyer Award would be fully met and the pledges strictly honoured.

Road-Rail Bill being Drafted

Sir Sultan next dealt with the road-rail problem and said a draft Bill was under discussion with the Provincial Governments and would probably be placed before the Central Legislature at the next Delhi session. In the meantime the opinion of the Transport Advisory Council on the draft Bill would be obtained. Representations from motor trade and transport interests would also receive the fullest consideration. The Railway Member, however, reminded the House that the proposals of the Wedgwood Committee on the subject were based on the experience of the rail-road problem in Great Britain and other countries and, in his opinion, were not unfair to motor interests.

In regard to the recommendations affecting the future management of railways and amalgamations of systems, Sir Sultan stated that the Government was not in a position to do anything in the way of amalgamation before the existing contracts with guaranteed companies expired. He assured the House that no decision reversing the previous policy of the Government would be brought into effect before the matter was fully discussed in the Legislature.

Meghna Bridge, A.-B.R.

This new bridge, which is over 2,950 ft. in length and replaces a wagon ferry [as briefly described and illustrated in THE RAILWAY GAZETTE of July 30 last.—ED. *R.G.*], was opened for goods traffic during the first week in September, when the first public train crossed it. The bridge, which carries no road or public footway, is to be formally opened for passenger traffic on December 6, by Sir Guthrie Russell, Chief Commissioner of Railways. The estimated cost of construction is Rs. 64 lakhs (£480,000).

FRANCE

New Power Signalling at Nancy

This year the Eastern Railway completed the remodelling of the extensive power signalling equipment at Nancy, where the two Descubes route-lever signal boxes, one at each end of the station, containing 40 and 19 levers with mechanical combination action, have been replaced by the purely electric apparatus designed by that engineer. Control is now concentrated in a new signal-box containing 55 levers, working on the "entrance" and "exit" principle, long ago adopted by the Est; 70 points and 76 signals, forming 198 separate routes or movements are operated from this box. The extent of the layout necessitates its division into 4 distinct zones. There are 106 track circuit sections, and 986 relays, of which 732 are in the signal box; the large number of relays is a characteristic of the Descubes system. Special call-on action with stationmaster's control is used to bring trains into an occupied platform line.

The substation contains two converter groups for supplying current at 24 V. for the control and detection circuits, and 110 V. for point operation, and there are three accumulator batteries, 2 at 24 V. and 1 at 110 V. As in all new work of this type on the Est, reserve point and signal control commutators are provided in emergency signal huts in different parts of the layout, to enable working to be carried on with the maximum facility, should the signal-box be destroyed or seriously damaged.

RAILWAYS AND ROAD TRANSPORT SECTION

This section appears at four-weekly intervals

Bertram Tee

ALTHOUGH he was known to have suffered in health within recent years, the sudden death on September 15 of Mr. Bertram Frank Tee was a great shock to his wide circle of friends in both railway and road transport circles. Probably very few with whom he came in contact realised that he was 61 years old, for his appearance and business habits were those of a man in the late 40's, but his railway career began as long ago as 1890 when he entered the service of the G.W.R. and had several years of general station experience in the Reading district. He then transferred to the office of the Superintendent of the Line at Paddington, and served in the timebill, rates & fares, and staff sections; in the last-named connection he was responsible in 1919 for the whole of his department's share in the general classification of staff. As the result of his varied experience he became a valued member of the staff of the Road Transport Department, which he joined on its formation in 1922 as Chief Clerk. He subsequently became Assistant to the Superintendent and in August, 1934, was appointed Commercial and Operating Assistant to the Superintendent of Road Transport, the office which he held until his death. All who came into association with him, whether his immediate colleagues or representatives of other railways and commercial concerns, were quick to realise his undoubted talents. His power of assimilation of detail, together with cool judgment and ability to express his views clearly, made him a valued member of the various committees with which he was associated, and he played no unimportant part in the many inter-railway discussions regarding road transport problems. Outside railway work he was a lover of country life, and had marked literary tastes. He was, moreover, keenly interested in educational work and in the debating societies with which he was prominently connected. Mr. Tee was an occasional contributor to our columns on road transport subjects and his wide knowledge and lucid style proved valuable assets in setting forth the essential detail of intricate licensing and operating problems.

Are Coloured Headlights of Value?

MANY thousands of motor vehicles are equipped with headlights giving coloured light, because of the widespread belief that coloured light is better than white light of the same power for driving at night or in fog. Opinions on the subject have been by no means unanimous, however, and we welcome the opportune publication of a report on the subject prepared by the Department of Industrial and Scientific Research. This brochure, which we notice briefly under the heading of "Publications Received" on page 686, concludes that none of the claims made in favour of using a coloured, and, in particular, a yellow headlight beam rather than a white beam of no greater power, has been substantiated. The claim for a greater range of visibility in fog is regarded as definitely disproved, and on the other claims for less dazzle and greater facility of vision the evidence is inconclusive. Moreover, it is apparent from the information at present available that further work is unlikely to show that any considerable advantage can be secured by using coloured lights. There is a conflict of evidence on the question of whether the use of coloured light obtained from white light by the means of a colour filter enables the eye more easily to detect contrasts of brightness. According to a recent investigation, a small advantage is secured by the use of a yellow filter, but this result is inconsistent with the measurements of earlier workers. Where small advantages can be demonstrated to favour the use of a yellow light, the improvement would appear to be too small to have any practical significance. For example, there is evidence for a slight increase in the power of the eye to perceive details of a pattern in black and white by the use of a yellow light secured by means of a filter from white light, but the 3 or 4 per cent. increase in visual acuity merely results in the details of an object which might be distinguished in white light at 100 yd. becoming distinguishable with a yellow filter at 103 or 104 yd. The time which the eye takes to react in the presence of, or following exposure to a dazzling light is also slightly reduced with the use of yellow, but here the effect is so small (3 or 4 hundredths of a second on reaction times of the order of 0·2 sec.) that it is doubtful whether any help is given to the eye in driving at night time.

The First Road Motor?

ALTHOUGH it is generally recognised that early forms of steam automobile were tried in the latter part of the eighteenth century, few writers have mentioned an experiment of a hundred years previous to that time which resulted in the construction of the first thing to move itself of which evidence has survived. This was a model steam carriage made by Father Verbiest, a Jesuit missionary at Pekin, about the year 1681, and possibly as early as 1665. The available information concerning the experiment was outlined by Mr. C. F. Dendy Marshall in his recently-printed presidential address to the Newcomen Society entitled "The Germs and Development of Some Mechanical Inventions." He said that this pioneer vehicle was described in Chapter XXIV, Pneumatica, of a rare book entitled "Astronomia Europæa," by R. P. Ferdinand Verbiest, S.J., published at Dillingen, Bavaria, in 1687. The description, which is in Latin, is to the effect that about three years before, while investigating the power of the æolipyle, he made a four-wheeled chariot, two feet long, in the middle of which he placed a vessel full of live coals, and above that an æolipyle. On the axle of the front wheels was a bronze ring with teeth, driven by gear wheels from one with four wings, on which the jet from the æolipyle impinged. Father Verbiest was using the word to mean a little boiler with a spout to it. By means of a tiller connected with the rear axle, he made the carriage run in a circle. The suggested date of 1681 for the model is based on the fact that the book contains the formal permission to publish from Father Verbiest's superiors in the Society of Jesus dated "Romae 26 Novembris 1685," and Mr. Dendy

Marshall points out that as the author was in China it must have been written in 1684 at least. It appears from "Ferdinand Verbiest, Ecrivan Chinois," by Louis Van Hee (Bruges, 1913) that "Astronomia Europæa" was published in Chinese as early as 1668, but Mr. Dendy Marshall states that he does not know whether that edition contained the account of the "little chariot." If a copy of the Chinese version has survived and contains the same details, it will presumably be the earliest account of a road motor. Mr. Dendy Marshall's suggestion of the date 1665 is based, of course, on the supposition that the Chinese work also said "about three years before" which seems unlikely to us, as it assumes the Latin edition to be a mere translation from the Chinese without even being brought up to date.

Danish Rail and Road Bridges

APART from the mainland of Jutland, Denmark consists mainly of five large islands, one one of which Zealand—the capital city of Copenhagen is situated. Train ferries with accommodation for road vehicles have provided the necessary links until the last few years, when the first step in a comprehensive policy of rail and road bridges was taken by the building of the Little Belt bridge* connecting Jutland and Funen. This was opened in May, 1935, when already two other bridges eliminating train ferries—the Storstrøm and the Oddesund†—had been taken in hand, and, as outlined in our Road Transport Section for April 10, 1936, schemes had been prepared for two further, and very much larger (11-mile) structures intended to join Copenhagen and Malmö across the Oresund, and to span the Great Belt which separates the islands of Funen and Zealand. The Storstrøm bridge was opened on September 26, and the Oddesund is expected to be finished early next year. The former, two miles long (see editorial note on page 675), although a simple, straightforward structure, incorporates the latest developments in the science of bridgebuilding which have made possible the achievement of remarkable economies in design and construction. It connects Falster with Masnedø, between which islands hitherto a train and motor-car ferry has plied. Masnedø and Zealand have long been connected over the Masnedsund by a railway bridge on which, some years ago, timber decking was laid at rail level to take road motor vehicles. This bridge has now been replaced by a stronger structure on the new alignment of the road and railway, and with separate tracks for each. Altogether the whole work measures from end to end, including both bridges and their approaches, about six miles, of which the Storstrøm bridge itself is some 10,537 ft. in length.

The Danish Legislature authorised the construction of this new road and rail link in the international route between Germany and Denmark in its 1931-32 Session, and a contract was signed on May 13, 1933, with the British firm of Dorman, Long & Co. Ltd., for the construction of the whole work, with the proviso that wherever possible Danish labour should be employed. While Dorman, Long & Co. Ltd. directly undertook the fabrication and construction of the superstructure of the Storstrøm bridge, the Danish firm of Christiani & Nielsen was therefore entrusted with the sub-contract for the foundations and piers. Dorman, Long also manufactured and erected the steelwork for the Masnedsund bridge, but Sir William Arrol & Co. Ltd. fabricated and supplied the structure, including a bascule span with its machinery. The subcontracts for the earthworks, approaches, and road and rail connections were let to Danish firms.

The cost of the Storstrøm bridge was about £1,270,000, and of the Masnedsund bridge £110,000, exclusive of the cost of land, &c. Dorman, Long's contract included nine kilometres of railway, ten kilometres of road, seven smaller bridges and two stations, bringing the total cost of the whole undertaking to about £1,820,000. The terms of the contract required the work to be completed by November 13 this year, and the fact that it has been possible to open it in time for the current winter train services, which began on September 27, reflects great credit on all concerned. The work was supervised on behalf of the Danish State Railways by Mr. H. Flensborg, Chief of the Way and Works Department, with Dr. Anker Engelund, the designer of the bridges, as Consulting Engineer for the bridgework, and Mr. Th. Engquist, Chief Engineer, New Construction, in charge of all works on land. The undertaking has been financed partly by the proceeds of a tax of 1 øre per litre on petrol, introduced when the bridge project was endorsed four years ago, and partly by a contribution from the State Railways of about £700,000 corresponding to the estimated saving resulting from the elimination of the train ferry. In addition, the two counties joined by the works have contributed £130,000 for the approach motor roads. In this way both rail and road interests have shared in the cost of providing this new facility.

Shock-Absorbing Barriers

THE toll of level crossing accidents in the United States has been an incentive to inventors, one of whom, recognising that the most elaborate warning devices are powerless if the road vehicle is out of control, has devised an elastic wire-rope barrier claimed to arrest runaways without damage. We reproduce an illustration of the barrier in action. When no train is signalled, the barrier is hauled up clear of the road, but drops to the position shown when the signals are pulled "off." The raising and lowering may either be automatic, and interlocked with the signalling, or performed by hand. The device is equally applicable to road intersections, where it could

Experimental shock-absorbing level-crossing barrier in action at Madison, Wisconsin. The picture was taken last winter when the roads were covered with smooth ice

* See our issue of May 24, 1935, page 1028.
† See our issue of September 3, 1937, page 394.

work in conjunction with the signal lights and be lowered against the traffic stream which is to be held up. In this case a modified pattern is proposed, as it is necessary to bar only one half of the road, at each side of the crossing. Pedestrians would also be protected from drivers ignoring the lights, "filtering" when not supposed to do so, or slipping across after the green has changed to yellow. Costs of operation and maintenance for a single gate are stated as 35 cents a day.

Railways and Road Transport in India

PROBABLY no criticism of Indian railway policy in the Wedgwood Committee report is more keenly disputed by the railway administrations than the indictment embodied in paragraph 160 on the subject of railway-owned road services. As almost every sentence in this paragraph is illuminating and of general interest, we quote it in full below.

"Broadly, the Indian railways have made no attempt to use the partial powers which they now possess. It has been felt that in the present chaotic conditions of road transport, whether passenger or freight, no concern which attempted to carry on a service on sound economic lines could hope to make a profit, or indeed emerge without serious loss. Present-day omnibus fares are undoubtedly below a proper economic level. The buses are in bad physical condition and frequently overloaded. They are largely driven by their owner, or by his family, under conditions as to hours and wages which defy competition. There is an excess of buses on the most remunerative routes, and it may be taken for granted that a railway-owned bus service would be the target for the most intensive competition on the part of the existing omnibus owners.

"We accept this view. It seems to us evident that no responsible firm of omnibus owners could carry on at a profit under existing conditions outside the main centres of population. This would be especially the case with railways, whose standards as to maintenance of vehicles and as to wages and conditions of service of staff must be exceptionally high.

"None the less, we think it regrettable that railways have not embarked upon road services and faced the losses involved, regarding them as the price to be paid in order to gain their footing in a new and important branch of the transport service. Our reasons for this view are:—

(*a*) A resolute attempt by the railways to provide a good and efficient omnibus service would have done something to earn them the goodwill, from the lack of which they suffer so much at present, in any attempt to make good their position against road transport. They would at the same time have established a claim for consideration as road carriers by the mere fact that they were on the roads and endeavouring to provide a respectable service.

(*b*) The existence of an efficient and economical road service run by the railways would have made more evident the deplorable character of the service provided by others and would have strengthened the demand for some measure of regulation in order to bring other services up to the railway level.

(*c*) The annual loss to the railways would in our opinion have been trifling compared to the loss which has been incurred by the diversion of traffic to the roads, and would probably have been more than counterbalanced by the effect which the railway services would have had in discouraging the establishment of outside competition.

"We hold this view the more strongly having in mind the experience of the South African Railways in this matter. These railways provided services when they had no exclusive powers or preferences as against outside competition. Their services were frequently run at a loss, but they made it their business to share the work with outside competitors and to create a good understanding with them. When the time came for the institution of a proper system of regulation, the railways had shown that they were well disposed to road transport and capable of providing it on economic terms in co-operation with other road transport interests. In these conditions the railways were able to secure a strong position as participants in the road transport industry, and it can be claimed that a more complete measure of co-ordination between road and rail has been achieved in South Africa than in any other country in the world."

Though the results in South Africa are indisputable, it is possible that conditions there were not entirely similar to those in India at present, and we feel that at the moment there is a good deal to be said for a policy of "marking time," in the face of the momentous impending changes in both the Government of India and in the Railway Board, and until such time as the road conditions are less "chaotic." At any rate, this is a problem that must be confronting railways in many Dominions, Colonies, and other countries, and the question of whether or not a heavy loss in the early stages is justified on the grounds set forth in the report, is one that must be decided by consideration of these pros and cons as adaptable to local conditions in each individual case.

Before leaving this question as applied to India, it may be noted that the argument is often used that, because the Nizam's State and one or two other railways owned by Native States run their own road services successfully, British Indian railways should also be able to do so. Those who so argue seem to forget, however, that such Sovereign States are empowered to control all road traffic in their dominions to suit their own ends as owners of the railways, a very different position from that in British India where the Provinces are supposed to control road transport and the Government of India owns the railways.

The Prospects of Road Traffic Control in India

IN the course of his speech as Chairman at the ordinary general meeting of the Barsi Light Railway Co. Ltd., briefly recorded on page 627 in our issue of October 8, Sir Ernest Bell, called attention to the inroads of uncontrolled road competition upon earnings, and said that the Government had taken prompt action on the recommendations of the Wedgwood Committee in this connection. As a check upon inadequate regulation and chaotic conditions on the roads, the outline of a proposed Bill to replace the Indian Motor Vehicles Act, 1914, had been drawn up, and was, he said, now under consideration by all parties concerned. In Sir Ernest's opinion, this draft Bill went a long way towards satisfying the demands of railway administrations for fair treatment in respect of road competition. If the Bill was passed in its present form without much modification, it would place this competition on an equitable basis, provided that its terms were enforced by the Provincial and other local authorities in the spirit in which the measure was intended to be administered.

Relieving Industrial Tedium

THE monotony of mass production breeds a boredom and fatigue that is not relieved by the satisfaction of the old craftsman in seeing the finished product of his activity and rejoicing in his achievement. This monotony, which appears to be an essential feature of modern industrial methods, is capable of alleviation, however, and it is a cause for real surprise that only at the present time, after about a century and a half of production by machinery, have serious efforts been made to profit by the world-wide experience of bygone ages in regard to the most satisfactory performance of other wearying and mechanical tasks. From time immemorial the tedium of long route

marches has been relieved by the military band, not with any object of making the soldier's life easier, but on the strictly utilitarian grounds of securing from him greater efficiency. Even our pleasures can become wearisome if they require constant repetition of the same action, and a silent dance, for example, is unthinkable. These thoughts come to our mind because we have recently seen impressive returns showing the value of music as an ally of industry in securing increased outputs from workers engaged in monotonous tasks, and reductions in the percentage of errors of clerks engaged on such work as sorting. The subject is of particular interest to the motor manufacturing industry, both because the production of motor chassis tends more and more to become an assembly task, and also because one of the larger English motor companies was among the first of the engineering concerns in this country to broadcast music to its employees. It has been shown that the satisfactory results can be estimated quantitatively with some precision, and we learn that a large American plant stops its machines at 10 a.m. and 3 p.m. for short periods while the employees listen to music "to counteract the fatigue curve." The loss of 108 minutes a week is more than offset by increased production, and by material reductions in imperfect work. The effect of music while work is in progress has been shown in one British factory to increase production 11·3 per cent. above the normal. A prominent American industrialist recently forecast that by 1940 music would have become a universal tool of factory management, and even if this should prove unduly optimistic there seems no reason why serious consideration should not be given to a system which has already proved itself efficient in certain spheres and gives promise of increasing both happiness and output at a trivial cost.

Publications Received

Communication has been Established. By Astley J. H. Goodwin. London: Methuen & Co. Ltd., 36, Essex Street, W.C.2. 8 in. × 5¼ in. × 1 in. 268 pp. Illustrated. Price 10s. 6d. net.—Presumably the title of this volume was selected with the object of attracting popular interest, but we think that the serious reader will find it the least satisfying feature of a remarkable book. The author, who is Senior Lecturer in Ethnology and Archæology at the University of Cape Town, has produced, in most readable form, a valuable survey of the development of communications both by water and land from the earliest times to the zenith of the Roman Empire. Moreover, within the compass of 259 pages of text he has done the work extraordinarily well, and has produced a book which should not be ignored by any subsequent writer on early communications who sets out to deal with one aspect in detail. The bird's-eye view presented by Mr. Goodwin is amplified by a sound three-page bibliography which includes the most recently-published works throughout the world. Ancient authorities are quoted in the text, and thus a happy medium is achieved between the purely technical work and the popular handbook with its almost invariable accompaniments of superficiality and inaccuracy. Although Mr. Goodwin has obviously set out to produce an easily-readable account that should prove attractive to the lay reader as well as useful to the student, he shows himself throughout to be a deeply-read authority on his subject, and gives no evidence of taking a short cut by accepting popular but unauthenticated fables.

One example of the author's erudition must suffice, and that is his reference to the origin of the wheel. Few persons can have escaped having been presented with the plausible, but entirely unsubstantiated, theory that the precursor of the wheel was either a simple roller or a disk cut directly across a tree trunk, but the author shows that there are strong objections to every step of this conjectural evolution of the wheel from the roller. The most striking objection is documentary, for so far as our information on early vehicles goes, the wheel preceded any knowledge of the roller as a means of conveyance by something like two thousand years. The Elamites, Chaldeans, and Sumerians all seem to have known the wheel by 3000 B.C., but research has failed to reveal the use of a roller as a vehicle until the time of King Sennacherib, about 780 B.C. Quite as striking is the author's commonsense observation that the disk sawn from a tree-trunk pre-supposes some efficient means of sawing in an age when the only cutting tools were adzes, axes, sword-blades, and short flint saws capable of cutting only shallow V-shaped grooves. The first true disk wheel depicted comes from an ox-wagon of the reign of Rameses IV, dating from about 1200 B.C., whereas composite wheels are depicted many centuries earlier. Probably the oldest wheel known to us today is that excavated at Kish in 1928 by the Field Museum of Natural History, Chicago. These wheels, composed of sections of wood joined together and held in place by copper nails embedded in a rim of hard white substance, are illustrated as the frontispiece. We wish that Mr. Goodwin's remarks on this point could be brought to the attention of every writer who purports to deal with early transport; but, indeed, the whole volume, despite its unattractive and perhaps misleading title, constitutes a notable addition to our stock of easily-accessible and authoritative literature concerning the early years of civilised man's most vital achievement—communication with his neighbours.

Green Line Coach Guide.—The third edition of the London Transport Green Line coach guide, which is current from October 6 to January 4 next, includes (apart from up-to-date timetable information, fares, positions of boarding points, and maps), several new features designed to make the booklet more attractive to those who use it. There is an illustrated article, entitled "Where does my coach stop?", explaining the policy of stopping places and showing how signs, timetables, and shelters have made travel more comfortable and more convenient. A picture in colour of a Green Line coach is the first of a series to be continued in subsequent numbers. There are also two walks, in rural Essex and over the Surrey Hills, hitherto unpublished, and twenty-one sketches by an artist whose playful pen conjures a laugh from "Rules and Regulations."

The Use of Coloured Light for Motor Car Headlights. Illumination Research Technical Paper No. 20. London: H.M. Stationery Office; Price 9d. net.—On the last day of September the Department of Scientific and Industrial Research issued a valuable report setting out the results of experiments into the use of motorcar headlamps giving coloured light with the object of improving driving conditions at night and in fog. It has been a vexed question as to whether a coloured headlight is worth while, and this report supplies the material for giving an answer by setting out the results of investigations into such questions as range of visibility and reduction of dazzle. A prefatory note is written by Mr. C. C. Paterson, Chairman of the Illumination Research Committee of the Department of Scientific and Industrial Research. The findings are briefly discussed in an editorial note on page 683.

C.A.V.-Bosch Accessories.—C.A.V.-Bosch Limited, of Acton, W.3, send us a handbook containing working particulars and running instructions for a number of motor vehicle accessories in the manufacture of which this firm is engaged. Included are windscreen wipers, shock absorbers, switches, direction indicators, fuses, fuse boxes and fuse wire, and adjustable magneto couplings. The running instructions given are comprehensive, and the working particulars lucidly set out with the aid of diagrams.

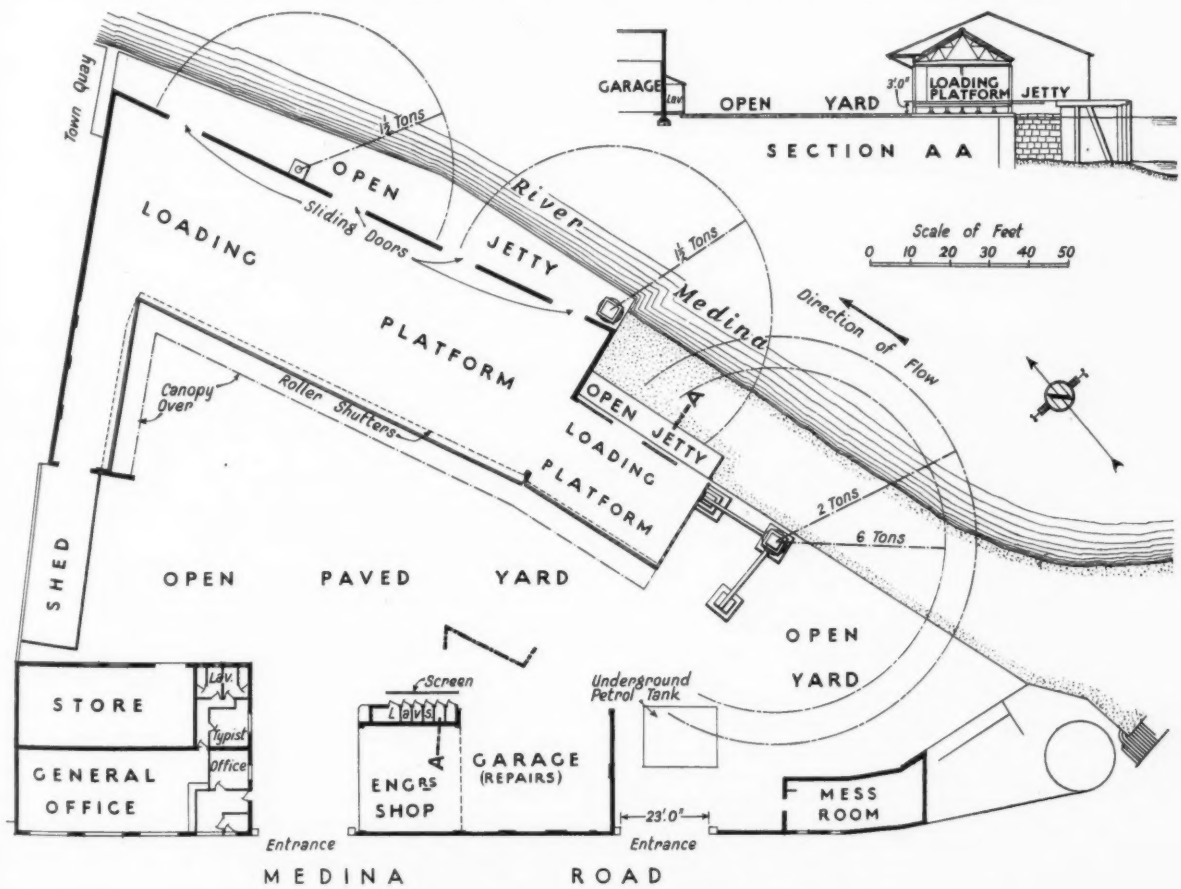
Isle of Wight Transport Co-ordination

An important scheme which has been made possible by the extensive enlargement and rebuilding of Pickfords Medina wharf, Cowes

AN important step in the co-ordination of road and rail services has recently been taken in connection with traffic to and from the Isle of Wight. Under these arrangements the separate handling of small packages is avoided by their delivery throughout the Island by the road services of Pickfords Limited. Such goods traffic, which is dispatched by rail from all parts of Great Britain, is taken by rail to the new Fratton depot of the Southern Railway (described in THE RAILWAY GAZETTE of July 17, 1936), and from there is handed over to the Portsmouth depot of Pickfords Limited. That company is responsible for the remaining part of the journey. Goods consigned by the way of road are also received at the Pickfords depots at Southampton and Portsmouth where they are transferred to the company's own cargo boats (totalling 25) and carried to the Cowes wharf for sorting and delivery. An example of the expedition afforded is provided by the fact that goods handed in one day in London are delivered to any part of the Isle of Wight on the following day.

An essential feature of this co-ordination scheme is the reconstruction and enlargement of the wharf and transit depot at Cowes, generally known as Medina wharf, but sometimes referred to by Pickfords Limited as Thetis wharf. This wharf, which formed part of a reclaimed mud land, is constructed chiefly upon reinforced-concrete piles. These average 79 ft. in depth, and the bearers have a 9 in. reinforced-concrete topping. The piles were driven through 55 ft. of soft grey clay, 5 ft. silt, 10 ft. solid clays, and 9 ft. of loose flints and clays to a firm bed on solid flint. The new depot was formally opened on September 23 by Sir Herbert Walker in the presence of a large gathering including many business men interested in transport services to the Island, and on that occasion it was pointed out that the enlargement and reconstruction of the depot had involved nearly £19,000.

The transit and loading platforms, which are constructed in brick and steel with slate, asbestos, and glass roof covering, have a total open water frontage loading dock for boats 220 ft. long and 10 ft. wide, with wide openings to the sorting and transit platforms, 30 ft. wide. These have a vehicle frontage of 195 ft. with wide overhanging canopies for loading up under cover and fully enclosed by steel roller shutters. The goods from boats are transhipped by two 30-cwt. electric derrick cranes and one 6-ton electric derrick crane, the goods having been packed



Arrangement of the new Medina wharf of Pickfords Limited at Cowes

in specially designed skips suitable for intensive loading in boats. The vehicle yard in front of platform (which has been built up at a level to prevent flooding at exceptional high tides) is of 8-in. reinforced-concrete on 18-in. solid rolled hard core with bitumastic expansion joints, laid to falls and well drained. It has a superficial area of 27,000 ft., and the two entrances are each 23 ft. wide, with steel collapsible gates.

A modern block of offices to accommodate 20 clerks with private rooms, filing room, stores, and mess room for clerks, overlooks one of the entrance ways. There is also a large single-floor warehouse, 50 ft. by 20 ft., in brick and slate supported on piers, and a drivers' mess and rest room. The car and vehicle garage, in brick and tile, measures 40 ft. by 30 ft., and the equipment includes modern electric-driven petrol and oil installations. A motor engineers' maintenance and repair shop 40 ft. by 30 ft., is fitted with modern electric equipment. These measurements are approximate, as the engineers' shop and the garage are virtually one, without a dividing wall. Electric power and lighting points are provided, and a high-pressure vehicle-washing plant has been installed.

For the new depot the steelwork was supplied by the London & South Wales Steel Construction Co. Ltd.; the piling was carried out by Christiani & Nielsen Limited; the electrical system installed by J. Hearson & Co. Ltd.; and the electric cranes supplied by Butters Bros. & Co. Ltd., of Glasgow.

Overseas Notes

New Lightweight U.S.A. Sleeper Bus

A new type of sleeper bus has just been completed by Sleeper Coaches Inc. of Detroit. It is constructed largely of lightweight metal, and is claimed to be capable of running eight miles to the gallon of fuel used. The ordinary heavy-weight sleeper at present in limited use in United States runs only about three miles to the gallon. A passenger rate of approximately two cents a mile is believed possible, with, of course, a berth surcharge. The new bus is 33 ft. long, 8 ft. wide, and 10½ ft. high. Accommodation is provided for 16 passengers, and each sleeping compartment has upper and lower berths running lengthwise; there are two lavatories. Like the modern sleeper aeroplane, the bus is insulated with good fibre, an air space, and a strip of aluminium foil.

Road and Rail Competition in the Gold Coast

As a corollary to the construction of new roads, an ordinance called "The Carriage of Goods Ordinance" has been passed by the Legislative Council of the Gold Coast to protect railway revenue. The object of the ordinance, which came into operation on November 1, 1936, is to avoid a heavy loss of railway revenue as a result of the programme of road reconstruction recently launched for the improvement of communications in the Gold Coast. As the new roads will provide important facilities for road traffic which do not at present exist, it was feared that, in the absence of any statutory restrictions, these roads would deprive the railway of a considerable amount of freight which it now carries. It is proposed in such cases, so far as is practicable and with the minimum of restriction compatible with the object in view, to prevent the carriage of certain goods along these roads. As, however, only one through road has been completed, it is at present too early to judge whether the restrictions will have the desired effect.

Substitution of Road Services for the Westport-Achill Branch, G.S.R.

On October 1 the branch from Westport to Achill was closed to all traffic. It served three towns, Newport, Mallaranny, and Achill. Newport is a small free port and the population is about 500. At Mallaranny the company has a first class hotel which is patronised to capacity during the season. It is set in beautiful surroundings and is a favourite tourist resort. Visitors to the hotel tend to travel by motor rather than by rail, as the motorcar enables them to visit the surrounding district. Achill, situated on Achill Island, is another small town, but is connected by a bridge with the mainland. The island is extensive and the roads have been greatly improved in recent years. Many of the inhabitants travel to England or Scotland each year for harvesting work, and it was from Keel, situated 10 miles on the direct road from Achill, that the ten victims of the recent Kirkintilloch burning tragedy travelled to obtain work in Scotland.

Prior to the closing of the line there was a bus service between Keel, through Achill, passing Mallaranny and Newport, to Ballina. This service gave a connection at Westport to passengers travelling to Galway and the South of Ireland. To provide substitute services for the passenger trains additional buses have been arranged to run between Westport and Achill at approximately the same times as the trains, which were run at a restricted speed. Motor lorries have been introduced for the conveyance of the goods traffic and live stock. Protests were made by the people of the district against the closing of the railway, but the fact remains that the company found it uneconomic to keep the line open and was compelled to close the branch.

Transport of Goods To and From East Abyssinia

Reports from Harar published in *Il Sole* of Milan, state that goods coming from Italy or going to Italy, are now being sent by road between Harar and the port of Berbera in British Somaliland. The use of this route is expected to do much to alleviate the congestion at Djibouti and on the railway, which cannot cope with all the traffic. The goods sent *via* Berbera will serve to complete the supplies for the Government of Harar, all of which have hitherto been received *via* Djibouti or Italian Somaliland. An Italo-British group formed for the purpose will carry out the transport at the rate of 14½ centesimi a quintal-kilometre for the right of transit across British Somaliland. Thus the transport of goods between Berbera and Harar will cost only 80 lire a quintal compared with 400 lire via Mogadiscio in Italian Somaliland.

ROYAL SOCIETY OF ARTS EXAMINATIONS.—We have received from the R.S.A. a copy of the brochure giving particulars of a scheme of education for administrative and operative staffs of road transport undertakings, together with a syllabus of the examinations under the scheme to be held in May–June, 1938. Classes under the scheme have already been set up in many of the larger towns throughout the country. Until recently there has not been any scheme on a national scale for the benefit of employees who undergo a course of study in road transport subjects but who are not in a position to take the examinations for graduate and associate membership of the Institute of Transport. To meet this need a Special Committee, representative of the road transport operations of the country, together with representatives of the Institute of Transport and the universities and technical colleges, prepared in 1935 a scheme and drafted syllabuses to cover a three years' course of study. The R.S.A. was approached and arranged to hold examinations and issue certificates to successful candidates. While the scheme is designed primarily for members of the administrative staffs, it is equally available to every grade of employee engaged in goods or passenger transport by road by any class of vehicle and including tramway, trolleybus, and motorbus operation. Copies of the leaflet and syllabus may be obtained from the Royal Society of Arts, John Street, Adelphi, W.C.2.

The Work of the British Electrical Federation

Services offered, on a cost basis, to the members of the Federation enable a large number of relatively small entities to enjoy the advantages of a central organisation, and without losing the benefits of local administration

WHEN the four British main-line railway companies secured the sanction of Parliament under Acts of August 3, 1928, to engage in general road transport activities, they adopted the policy as far as passenger road transport was concerned of co-operating with the existing large bus companies by securing a substantial (though not controlling) financial interest in such companies, and also arranged for establishing standing joint committees to secure co-ordination. At that time the bus industry was already well organised, and many of its larger units were financially associated with the British Electric Traction Co. Ltd. which had evolved an efficient system of co-operation among the units of its group. This organisation remains unchanged and has contributed materially to the successful working of the bus companies associated with the railways.

The British Electric Traction Co. Ltd. was formed as long ago as 1896, and adopted as its scheme of organisation the establishment of local companies in the various districts where it provided transport—mainly tramway—services, but secured those advantages which accrue to a very large undertaking through the medium of its head office services. In early years this took the form of a voluntary body called the Committee of Management which was appointed in December, 1898, and was succeeded in December, 1899, by the Committee for Associated Undertakings. This was followed by the Advisory Committee (elected by associated companies) which was constituted in April, 1902. The work carried out by these committees proved of outstanding value to the many companies associated with the B.E.T. and it was eventually decided to enlarge the scope of the committee and at the same time to give it a legal status so that it could contract in its own name. With this object the British Electrical Federation Limited was incorporated on July 19, 1907, as a company limited by guarantee, and having for its objects and powers the carrying on of the work which had hitherto been performed by the Advisory Committee, and for taking over from the B.E.T. the arrangements for carrying out standard service agreements with the federated companies. The objects may be summarised broadly as the provision on a cost basis of administrative and other services to the large group of electric traction and electricity supply companies in which the B.E.T. was then financially interested.

The new Federation began its active existence on July 1, 1907, and initially some 50 companies were members. By grouping the companies in the Federation they were enabled to call on the services of highly skilled officers to assist them in the operation of their businesses and to protect their interests on larger matters of policy. The Federation was thus able to provide for a number of relatively small entities the advantages of a central organisation which they would have enjoyed had they been one large undertaking, without disturbing the benefits derived from local administration. The important changes which have taken place within the last decade both in substitution of tramways with motorbuses, and also in the far more widespread operations of buses on rural and interurban service have affected the Federation, and resulted in certain modifications—chiefly as the result of greater autonomy on the part of the provincial managements—but the Federation still continues to perform the same fundamental services as at the time of its establishment, and its operations are of great importance in the conduct of the road passenger transport business of Great Britain.

Membership of the Federation is in practice still confined to companies in which the B.E.T. is financially interested directly or indirectly or with which that company is associated in business. Road passenger transport and electricity supply companies now predominate in the membership of the Federation. Among the motorbus companies that are full members are such companies as the Birmingham & Midland, Devon General, Hebble, Northern General, Potteries, South Wales, Western Welsh, Yorkshire Traction, and Yorkshire Woollen. Associate members include such bus companies as the Crosville, East Kent, Maidstone & District, Ribble, Southdown, and Trent. In addition to transport and electricity supply, the Federation is also representative of other industries and businesses. Some of the members are concerned with such diverse businesses as gas supply, laundries, and hotels. Other members are finance and investment trust companies. It is, however, only with the motorbus companies included in the membership that we are concerned here.

Services offered by the Federation to its members include, *inter alia*, office accommodation, legal, insurance, engineering, rating, stores purchasing, letting advertising spaces on vehicles, and providing secretarial, accountancy, and registrar's staff. Any member can call upon the Federation for such of the services available as it requires and the charges for all services rendered are arrived at on a cost basis. As already mentioned, the Federation is a company limited by guarantee and does not work for profit. The liability of the members is limited to £1 for every £1,000 of their *authorised* capital. The affairs of the Federation are administered by a council consisting of the chairman or managing director of every member company and of such other persons as may be appointed by the Federation in general meeting. Certain powers and duties of the council have been delegated to an executive committee (appointed annually by the council) which is generally responsible to the council for the exercise of the council's powers and duties. The President of the Council and Chairman of the Executive Committee is Mr. R. J. Howley, and the Secretary Mr. R. P. Beddow. The work of the various departments of the Federation is supervised and controlled by separate committees which are also appointed annually by the council.

Certain of the services offered require little explanation of their scope and functions; legal advice and assistance, for example, is an obvious necessity for any commercial undertaking, and the point does not need stressing that in a business such as road transport with its own highly-specialised legislation and procedure, wide and diverse experience has placed the legal advisers to the Federation in possession of an unrivalled store of knowledge. Office accommodation, with secretarial and other staff, is in

practice used only by the full member companies who are direct associates of the B.E.T. The head offices of the Federation are located at 88, Kingsway, London, W.C.2, and these are also the registered offices of the member companies availing themselves of headquarter and staff services. The following notes give further particulars of the work of some of the other departments of the Federation.

Inspection and Engineering Department

The title of the Inspection and Engineering Department requires a word or two of explanation, for the " inspection " side of its activities was originally the preparation of periodical reports to the B.E.T. of progress of the various provincial subsidiary companies under the direct management of the B.E.T. At the present time the department provides advisory and consultative services on all engineering matters and is equipped to make inspections and valuations and to furnish reports on prospective business and development. The department also deals with negotiations for the bulk purchase of bus chassis and bodies, and in advising on the design of bodywork is enabled to act as a clearing house for the interchange of views and suggestions for the improvement of specifications and design; it is thus in a position to assist standardisation as far as is practical and desirable, and in fact has played no small part in securing uniform simplicity and efficiency of design. Body designs are prepared and special features are patented for the common benefit of the members, and in practice a considerable volume of research work has been carried out with the object of securing improvements in such features as lighting and ventilation. The department also prepares for the general information of the various executives, summaries of the operating statistics of the various industries comprised in the Federation and in this connection standardisation of statistical information is dealt with in this department.

Stores Department

Co-operative purchase of stores by the federated companies is an important feature of the work, and has been, moreover, for many years. As long ago as July, 1904, the old Advisory Committee appointed a sub-committee to consider the question of strengthening the organisation for the purchase of stores, and the present extensive activities in this direction are the outcome of recommendations then adopted. The Stores Department acts as a central purchasing agent for all commodities required, including such important items as petrol and oil. The value of central purchasing is now generally recognised, and, apart from economies resulting from bulk purchasing arrangements, a good deal is automatically achieved in the way of standardisation of products and commodities used.

Insurance

Two types of service are offered in connection with insurance, of which the first is that the Insurance Department acts as agent for placing the general insurance business of the members. The other—and in many respects more interesting—service is the conduct of a third-party mutual insurance scheme. Early in 1903 the insurance company which had agreed to take up the third-party insurance business of the B.E.T. terminated the arrangement at short notice, and to meet the emergency a temporary mutual scheme was immediately devised by the Advisory Committee. This was followed by a more permanent partial mutual scheme worked out in conjunction with the Traction Insurance Association, and, in the year the Federation itself was formed, the entire management of the mutual scheme was taken over.

At the present time the department administers an insurance fund so constituted as to meet the stringent requirements of the Road Traffic Acts, providing protection against all third-party risks arising out of the operation of road vehicles. The fund is administered on a mutual basis, the cost of any accident up to a stated figure being ultimately borne entirely by the company incurring the accident, and any cost above the stated figure (other than cost falling within special reinsurance arrangements) being pooled and shared between all the members of the fund. Broadly, the contribution arrangement is that every member of the fund contributes over a period of years the cost of its own accidents up to the stated figure, and in addition to its proportion of the pooled costs based on car mileage. Every member also contributes its share of administration expenses and of the cost of reinsurance arrangements.

Advertising Department

The functions of the Advertising Department are confined to securing outside advertisements, and do not include publicity or " public relations " work. Indeed, the Federation has always adhered to the policy of leaving its member companies to handle individually such matters as communciations to the press, and the insertion of their own advertisements. The Advertising Department handles the letting of spaces on road transport vehicles, and national advertising emanating from the London area is dealt with directly. To deal with local advertising an organisation of resident canvassers has been built up whose activities extend over a large part of the country.

Rating Department

The Rating Department is prepared to deal with all assessments and valuations of properties for local rating and Schedule " A " purposes and conducts any appeals necessary. The large experience gained all over the country in dealing with properties of various kinds is of great common value.

Books and Forms

All books and forms in regular use are considered by the Books and Forms Department with the object of standardisation so far as desirable. As with other services of the Federation, the members are entirely free to accept or reject the products of the head office, but in practice it has been found that considerable advantage often accrues to the members as a whole in having statistics compiled on a uniform (and therefore comparable) basis.

Other Services

Among other activities the Federation acts as investment trustee for the British Electrical Endowment Fund and the British Electrical Provident Fund, to both of which practically all full member companies of the Federation belong. The object of the Endowment Fund is to provide salaried officers with a lump sum payment on leaving the service of their respective companies, and contributions to the fund are made both by the employing companies and by the officers employed. The Provident Fund serves the purpose of a central savings bank for employees on both the salaries and the wages staffs. At the present time approximately 1,300 salaried officers are members of the Endowment Fund and there are some 10,000 deposit accounts open with the Provident Fund. The Federation also acts as investment trustee for a number of staff benevolent and staff assistance funds constituted by member companies.

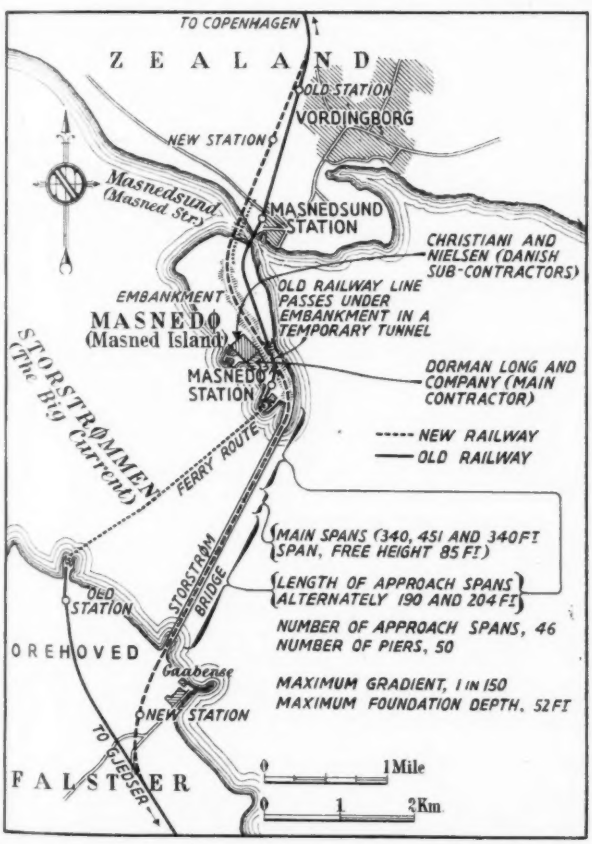
The Storstrøm Bridge

A general description of the new two-mile Danish road and rail bridge forming an important link in the international route between Germany and Denmark

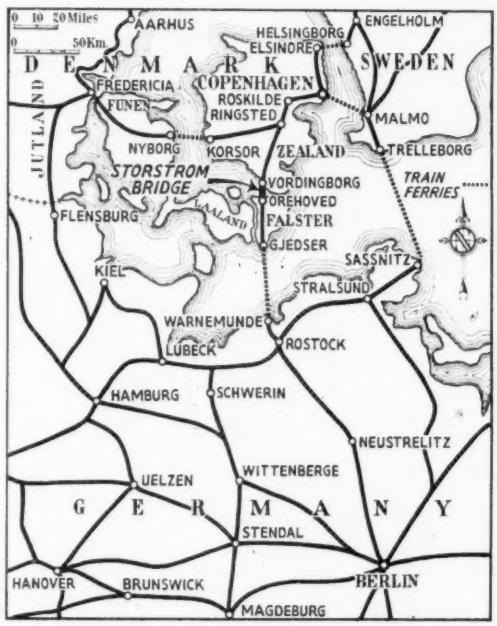
IN an editorial on page 684 we discuss the comprehensive scheme of road and rail bridges being undertaken in Denmark, of which an important stage was completed with the opening on September 26 of the new link between Falster and Zealand. This includes the great Storstrøm bridge—2 miles in length—and a new bridge over the Masnedsund, as shown on the site plan below.

The Storstrøm bridge consists of 50 spans rising from each end on a gradient of 1 in 150 to the middle of the stream where three navigation spans give a clear headway of about 80 ft. for shipping. The centre navigation span is approximately 452 ft., and the two side spans approximately 341 ft. each. The 47 approach spans are alternately 190 ft. and 204 ft. between centres of piers, and consist of steel plate girders 12 ft. deep with cantilevered and suspended girders alternating. The three navigation spans are of 12-ft. steel plate girders reinforced with steel polygonal arch ribs from which the stiffening girders are suspended.

All the main girders are of Dorman, Long's high-tensile Chromador steel having a minimum tensile strength of 82,000 lb. and a minimum yield point of 51,000 lb. per sq. in. Manganese steel of a slightly lower strength was used for the bridge decks. The main girders are carried on the piers by cast-steel bearings, alternately fixed and movable, the former consisting of two steel castings with radial contacts. The movable bearings are of the pendulum type so designed that the weight is always taken vertically whatever the position of the pendulum. This is achieved by so proportioning the radii of the bearing surfaces that the upper and lower lines of contact always remain in the same vertical plane. This feature is shown in our diagrams, which also illustrate the special enlarged types of bearings for the navigation spans.



General site plan showing the contractor's yards and harbour

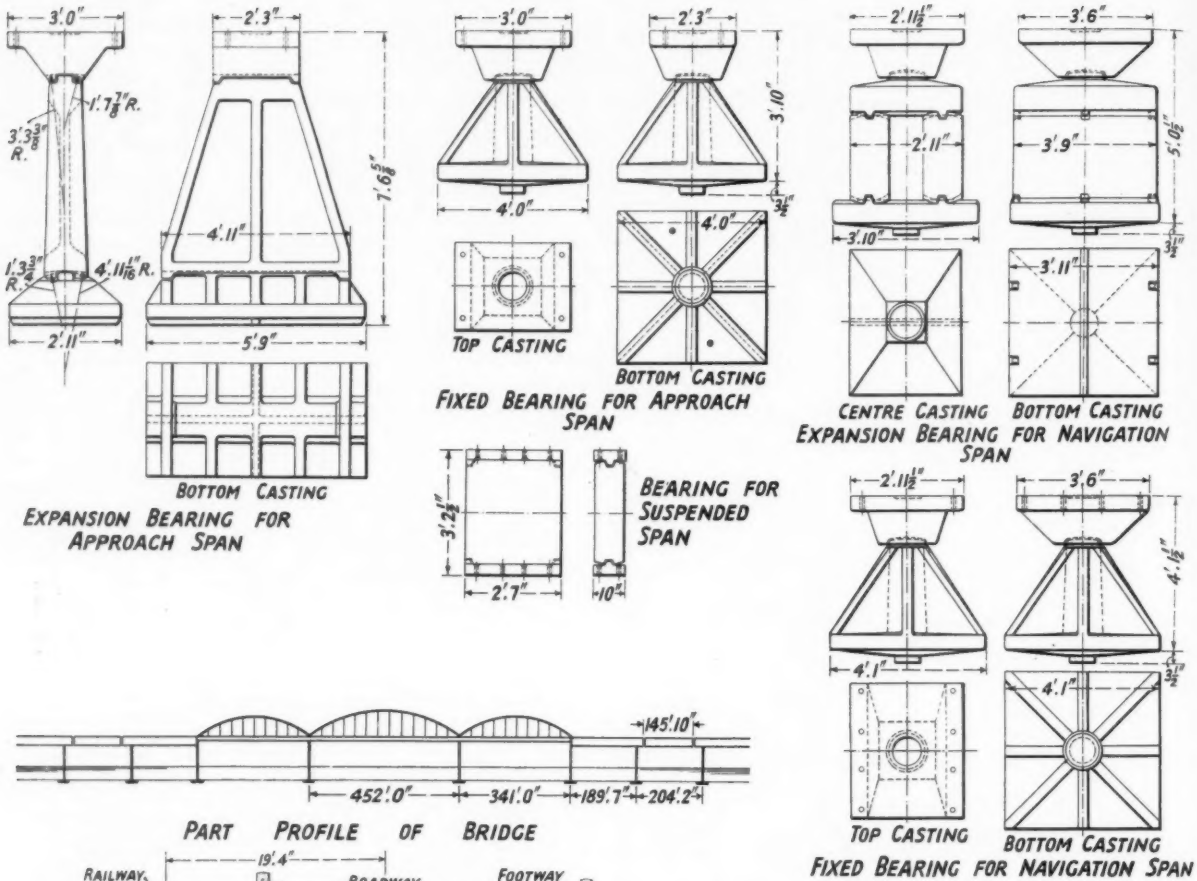


Key plan showing position of bridge in relation to international routes

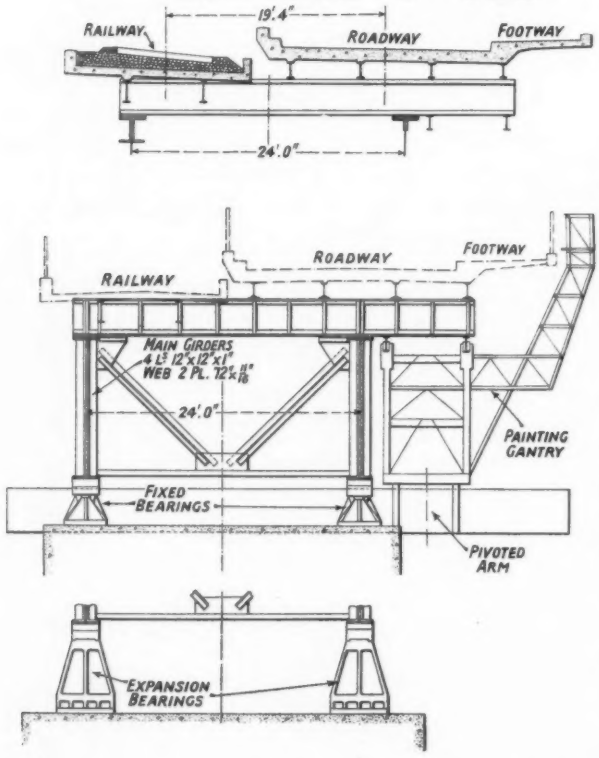
In the approach spans the webs of the plate girders are attached to the flanges by rolled Chromador steel angles of the unprecedented size of 12 in. × 12 in. There is triangular bracing between the main girders, and the cross girders are cantilevered out at one side to support the outer half of the 18-ft. roadway. The latter and the railway are carried by six lines of joist stringers, and the 8-ft. footway and cycle track on two lines of joist stringers supported by brackets further cantilevered out from the cross girders, as shown on the cross-sectional drawings. The roadway and footway are of reinforced concrete slab construction, and the railway is also carried on a reinforced concrete deck on which an ordinary ballasted sleeper track is laid. Expansion joints are provided for railway, road, and footway about every 360 ft.

The suspended spans are supported on the cantilevered ends of the fixed spans by means of steel castings in the form of segment rollers designed in the same way as the pendulum bearings on the piers, so that, whatever expansion or deflection there may be, the upper and lower lines of contact are always vertical.

The cross section of the navigation spans is slightly



Details of cast-steel bearings and part profile of bridge showing span dimensions



Cross sections of approach spans showing fixed and expansion bearings and travelling painting gantry

different from that of the approach spans, as may be seen from the drawings reproduced. In the former, both road and railway are between the main girders with the footway and cycle-way cantilevered out on one side, and the cross girders are correspondingly larger. On these spans, one end of each of which is borne on a fixed bearing and the other on an expansion bearing, the railway is not carried on a concrete deck but on timber transoms.

Five travelling painting gantries, one for each navigation span and each set of approach spans, cover the whole length beneath the cantilevered cross girders. Each of those on the approach spans has an arm projecting below the main girders and pivoted so that it can be swung parallel to the bridge when moving past the piers. A total of about 21,000 tons of rolled steel was used for the superstructure as well as approximately 800 tons of steel castings.

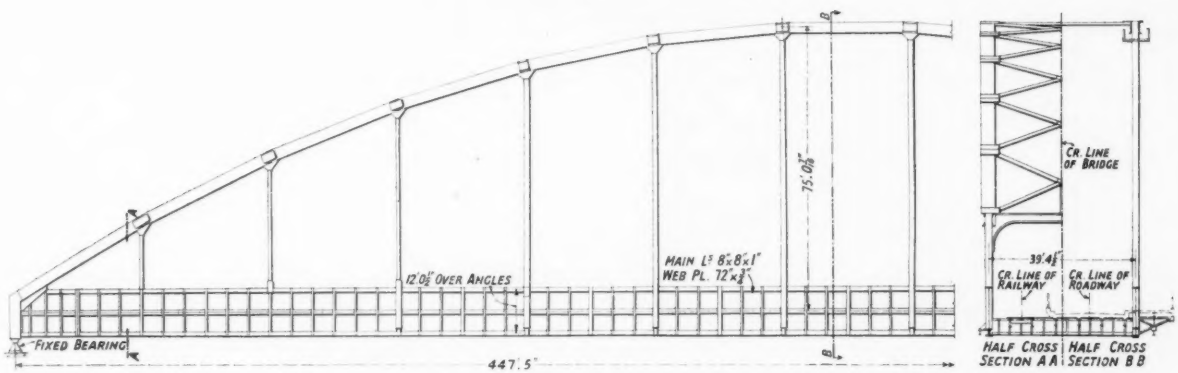
In previous articles* we have briefly described the process of erection and the construction of the foundations of the piers, in all of which much ingenuity was displayed. The longest steelwork sections sent out whole from England were from 39 to 46 ft. in length and were unloaded in a temporary harbour at Masnedø adjacent to the erection yard where the complete bridge spans were assembled with the aid of a Goliath crane. They were rolled out on parallel slipways projecting some 130 ft.

* See THE RAILWAY GAZETTE of April 28, 1933, and March 20, 1936.

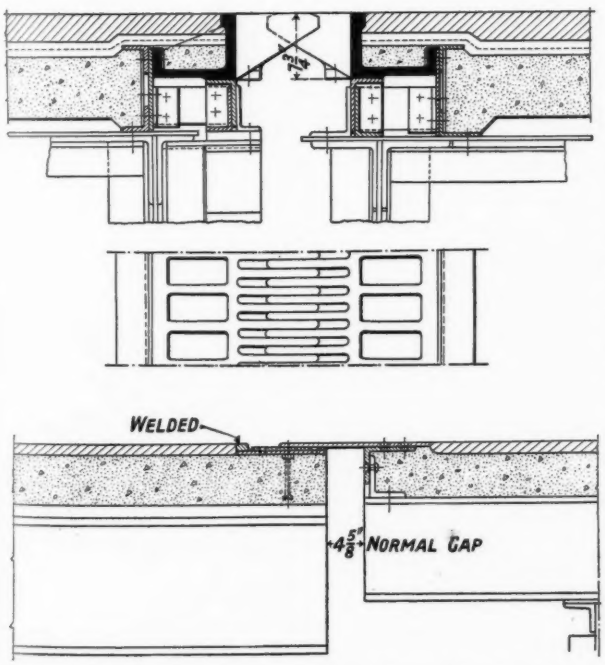
from the shore, and then lifted by a large floating crane which was towed to the site, and which placed the complete span on to the piers—or, in the case of the suspended spans, on to the cantilevered arms of the anchor spans. The floating crane, believed to be the largest in the world, was constructed by Burmeister & Wain, of Copenhagen, to Dorman, Long's design, and could lift 500-ton loads to a height of nearly 100 ft.; it was mounted on two pontoons each 165 ft. × 27 ft.

The three navigation spans, being too large to be dealt with whole, were conveyed in halves

General view of bridge showing navigation spans



Details of the large navigation span



Details of expansion joints in roadway (above) and pathway (below)

and supported in the centre by a temporary timber pier; the stiffening arch was subsequently erected, the span riveted up as a whole, and the temporary pier removed to the next navigation span where the process was repeated. This temporary pier had been built on shore, whence it was floated out to rest on specially-prepared temporary pile foundations which were subsequently removed. Steam winches supplied by Stothert & Pitt Limited, together with the necessary tackle were used, for lifting the sections of the bridge. In the erection yard and on the bridge several Morgan derricks were used in the assembling and erecting of the steelwork. A two-cylinder vertical single-acting air compressor manufactured by Broom & Wade Limited provided the compressed air for the operation of pneumatic tools and riveters supplied by the Consolidated Pneumatic Tool Co. Ltd.

Foundations and Piers

From the foundation to about 8 ft. above sea level the piers are of mass concrete construction faced with granite from 10 ft. below sea level. Above the mass concrete the piers are in the form of hollow reinforced concrete shafts with a top reinforced concrete bearing slab. The average depth of water in the Storstrøm is about 23 ft. with a maximum of 46 ft. The extreme tidal variation is about 6½ ft., although normally it hardly exceeds 1 ft. Pack ice in winter time is the reason for the 18 ft. of granite facing on the piers, which are shaped with their ends pointed to break the ice flow.

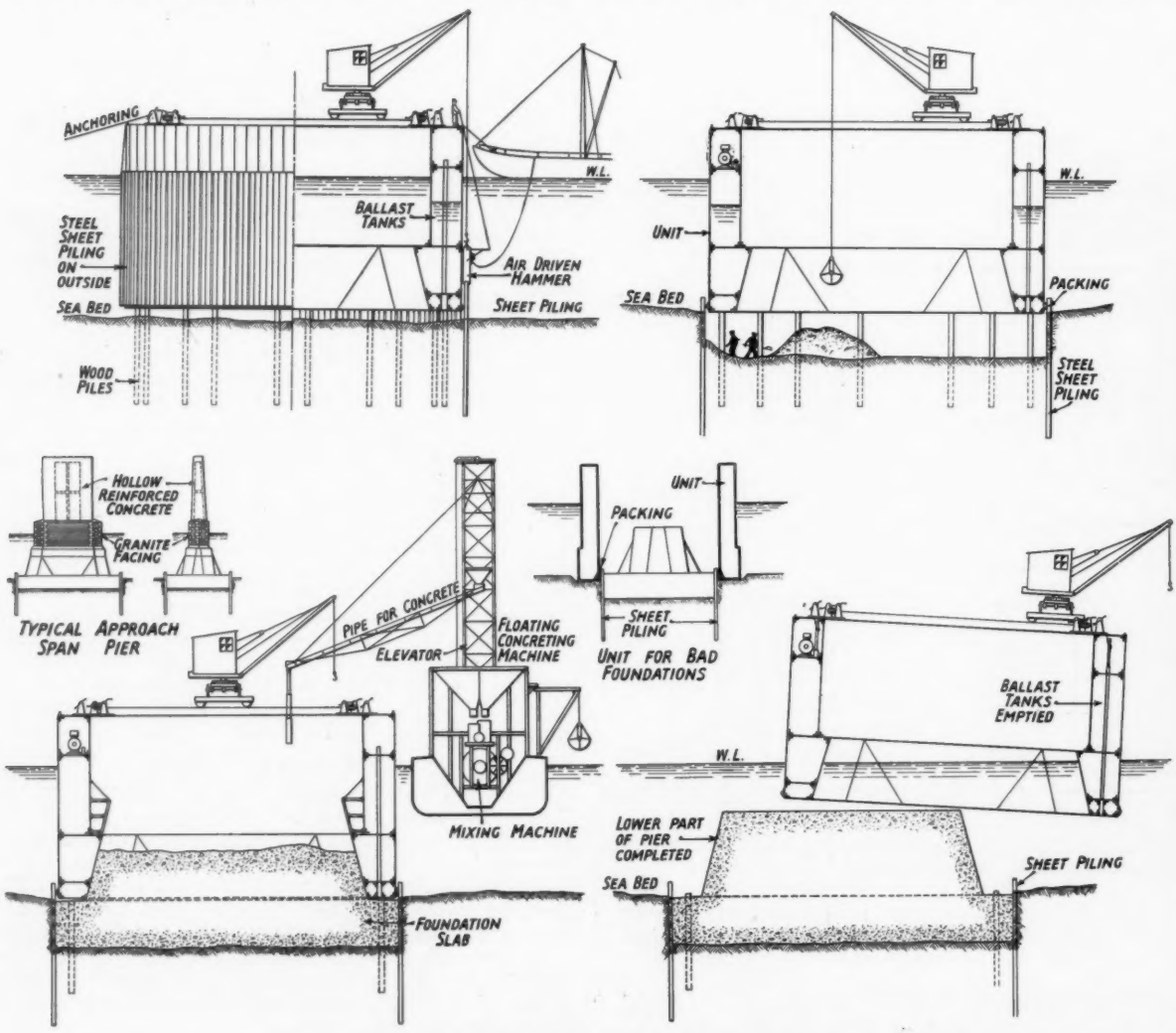
The bottom of the channel consists of clay containing

limestone boulders, and upon this all the piers are founded. Those in the shallow water nearest the Masnedø end were constructed inside ordinary sheet-piled cofferdams with appropriate bracing, and four—the large piers for the navigation spans—also inside braced sheet-piling which, immediately after the water had been pumped out, was strengthened with reinforced concrete stiffening frames.

The other 41 piers were constructed on an ingenious system devised by Christiani & Nielsen, the sub-contractors. A so-called unit (see diagrams) in the form of a double-walled oval steel caisson, open top and bottom, was constructed at Burmeister & Wain's works in Copenhagen and towed to Dorman, Long's temporary harbour at Masnedø, whence it was floated out and filled with water to sink it on the site of the pier. The unit, equipped with motor pile-driving gear, pumps, and other necessary machinery, rested on small piles previously driven to form an even bearing.

A skirt of steel piling, suspended round the outside of the unit in advance, was then driven from 25 to 40 ft. into the clay. The top ring of this sheet piling, when driven, bore against the caisson walls, and timber blocks were forced into the hollows in the piling, and between it and wooden strips on the caisson, so as to form a water-tight packing. The sheeting and caisson then together formed a cofferdam from which the water was pumped, and within which the sea bed was excavated to the requisite depth and then replaced by mass concrete. The inner walls of the caisson, tapering inwards and paper lined, formed the shuttering for the lower part of the pier shaft which was then constructed to within 10 ft. of water level, when the unit was removed, a process assisted by the paper lining of the tapered internal walls. After jacking free of the sheet-piling and concrete, and pumping the water ballast from the compartments between the hollow walls, the unit was floated clear, this being facilitated by asymmetrical water loading so as to tilt one side of the unit. The unit was then moved on to the next site.

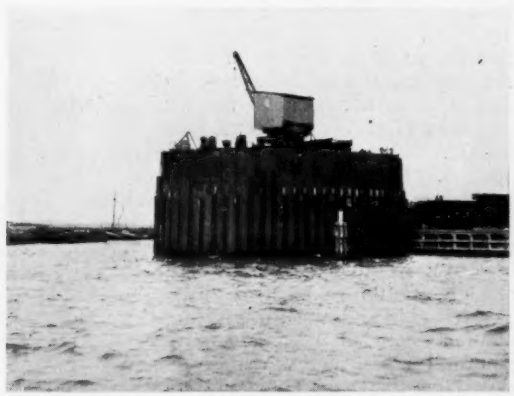
This type of construction was used for 27 of the piers on good foundations, but a modified type of unit was required for 14 piers where the clay was not consistent enough to permit of emptying the cofferdam of water before placing the concrete base. In these units the inside dimensions were made to correspond with the overall dimensions of the mass concrete foundation base, and the sheet piling, instead of being driven from outside, was driven from the inside wall of the unit. This was in order to allow excavation and concreting to take place under water all over the foundation area. The excava-



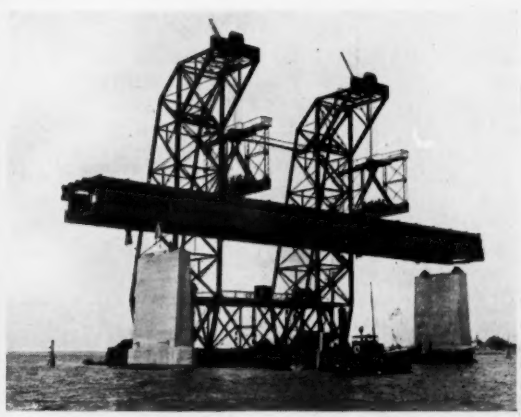
Stages in pier construction with special units and typical approach span pier

View of bridge nearing completion. Note the alternating fixed and expansion bearings on the piers

Procession of cars running alongside the inaugural train after the opening ceremony by the King of Denmark on September 26



Caisson "unit" with skirt of sheet piling ready to be towed to site



Cantilever approach span being lowered on to piers by 500-ton floating crane

tion to a depth of 10 ft. was effected by means of grabs, and the concrete was poured continuously through a large pipe reaching down to the bottom, the pipe being raised as the concrete base grew in thickness. This method can be carried out only by continuous pouring, and, as a precaution, a spare mixing plant was kept ready. When the base slab had been poured, the water was pumped out and the shaft concreted inside ordinary shuttering to the same height as the other piers, whereupon the unit was floated off, and moved to the next site.

The granite-faced section of the pier, which was then built up to 8 ft. above water level, was also the subject of an ingenious constructional scheme, being built on shore as a hollow 14-in.-thick oval ring of granite with reinforced concrete backing, and towed out between two barges to be lowered on to the top of the mass-concrete pier shaft. After the joint was made watertight, the oval ring was filled with concrete, and subsequently the top hollow reinforced concrete section of the pier was erected upon it.

Aerial view showing the northern approach to the Storstrøm bridge, including the old and the new bridges over the Masnedsund

The Masnedsund Bridge

The bridge over the Masnedsund consists of five fixed spans simply supported on piers and one bascule span having a navigation opening of 82 ft. The fixed spans are about 103 ft. each, and the bascule span 98 ft. Besides this and the Storstrøm bridge Dorman, Long's contract included 9 km. of railway, 10 km. of road, 7 smaller bridges, and two stations. From the view reproduced on this page some idea of the magnitude of the approach works on the north side of the Storstrøm can be gained. The two stations referred to are at Vordingborg and Orehoved, and from the site plan on page 691 it will be seen that the former replaces the old station of Vordingborg and also that of Masnedsund.

An interesting minor feature of the work was involved in the completion of the road approach on the north side. The old railway to the Masnedø ferry terminal ran in a temporary tunnel under the new railway approach embankment. The approach roadway is on an adjacent embankment at a lower level and was cut by the old line to the ferry. It was therefore necessary to withdraw all rolling-stock from the ferry station and the contractor's yard immediately before the opening ceremony so that a temporary bridge, fouling the loading gauge, could carry the new road over the old railway. This bridge had been erected about 3 ft. higher than its final level, and, although two hours were allowed for its lowering, the work was actually completed in 1½ hours.

View through the navigation spans

Railway, road, and foot-cum-cycle path over the bridge

Silver Jubilee of the Aldershot & District

In 25 years this business has grown from a fleet of a few buses carrying well under a million passengers annually to 246 vehicles transporting 20 million persons a year

SILVER jubilee and coming-of-age ceremonies provide striking reminders of the comparative youth of the provincial motorbus industry, and also afford suitable opportunities for reviewing the enormous development in this form of transport within the past few years. Recently, the Aldershot & District Traction Co. Ltd. selected the 25th anniversary of the incorporation of the present company to celebrate its silver jubilee, but the origin of the business dates back some six years earlier. As with many of the important (and now railway-associated) provincial bus companies, the Aldershot & District had a very modest beginning. The predecessor company—the Aldershot & Farnborough Motor Omnibus Co. Ltd.—was incorporated on May 11, 1906, with a capital of £3,000, all of which was subscribed locally and privately by 14 persons. The original fleet comprised four 20 h.p. double-deck Milnes-Daimler buses acquired second-hand from the Hastings & St. Leonards Omnibus Co. Ltd., when that company retired from business following the inauguration of electric trams in the Hastings neighbourhood.

One of the early double-deckers

The initial route (indicated by the company's title) was from Aldershot station to the Town Hall, Farnborough. Two buses inaugurated the service on June 1, 1906, and avoided a detour of 1½ miles along the main road by running with permission through the military camp. The ordinary single fare was 3d. but a special reduced fare of 1d. between Command Headquarters and Aldershot was charged to soldiers in uniform. The friendly military associations of the company thus started have continued ever since, and the Aldershot buses have always filled an important place in the local transport of this military area. The original route had been served previously by two horse-bus companies, each running a half-hourly service, and these concerns put up a brave fight before they succumbed to mechanical transport. Perhaps the fact that the first motorbuses on the route had an overall speed of 3 m.p.h. and an average "involuntary stop" record of one for every quarter-mile, encouraged the view that commercial motors were toys of passing popularity.

At first the staff numbered eight, and the original office was a small hut on wheels, of which the story is told that, as it lacked a safe, the daily takings were secreted for the night in the wastepaper basket! With perseverance the initial troubles were overcome, and on April 14, 1911, a service was opened to Farnham. The operation of a few motorbuses over comparatively short distances may not now seem to have been a great undertaking, but thirty years ago it was no mean feat to maintain regular services at all. Moreover, the purchase of new vehicles was then a financial venture, and it was not until some years later that sufficient stability was reached to enable new capital to be raised.

Formation of the Present Company

The British Electric Traction group came to the conclusion, as the result of its pioneer experiments, that there was a great future for the provincial motorbus, and its subsidiary the British Automobile Traction Co. Ltd., undertook the financing of promising enterprises. An agreement was made with the Aldershot company, and this resulted in the formation on July 24, 1912, of the Aldershot & District Traction Co. Ltd., which took over the undertaking of the Aldershot & Farnborough Motor Omnibus Co. Ltd., and adopted an agreement with the B.A.T. It is the silver jubilee of this new company which was recently celebrated. The fresh capital enabled new and improved vehicles—Leylands—to be secured and a policy of expansion to be undertaken.

The L.S.W.R. Service

An even earlier motorbus venture in this part of the country owed its origin to the enterprise of the old London & South Western Railway. To fill a difficult gap between two of its main lines, a contract was made by the railway with John I. Thornycroft & Co. Ltd. to maintain a motor service for one year on the Farnham—Haslemere route. Under the agreement the railway company took the receipts and guaranteed 10d. a vehicle mile to the contractor. Following experimental runs in November, 1904, the service was begun in February, 1905, with one *back* entrance single-deck Thornycroft petrol bus, and at the end of twelve months receipts exceeded the guaranteed 10d. a mile by about £115. The L.S.W.R. thereupon bought the bus and continued to maintain the service until 1913, when it was handed over to the Aldershot & District Traction Co. Ltd.

This acquisition extended the A. & D. activities southward to Haslemere, and in 1913 the company also took over the services between Hindhead, Grayshott, and Haslemere of B. Chandler. In the summer of 1914 the company owned 18 buses, and after the outbreak of the war acquired 40 lorries and 20 Foden steam wagons, which were all in daily use on passenger and goods-

XUM

Left: A modern single-deck Dennis bus in the Aldershot & District fleet, which includes over 160 single-deckers

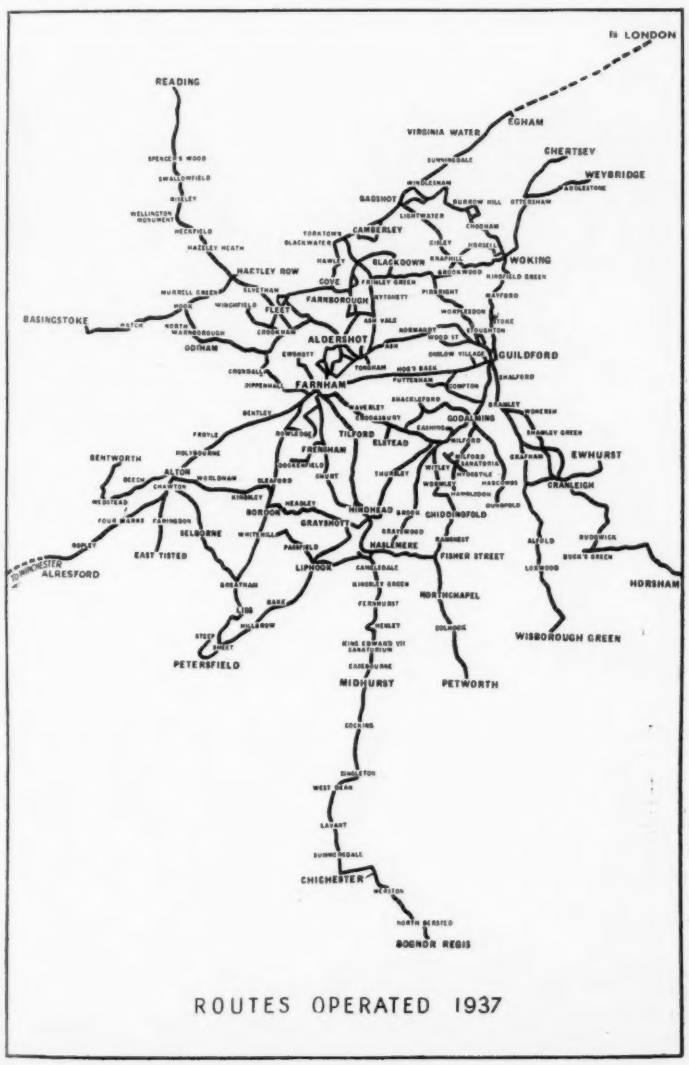
Right: An Aldershot enquiry office and waiting room

Left: A modern double-deck Dennis; the Aldershot & District fleet contains 43 double-deckers, all in a neat sage-green livery

carrying duties. Having regard to the military character of the area served, it is understandable that in some ways the company's difficulties during the war years were fewer than those of many other bus undertakings operating in the provinces. Supplies and labour were hard to obtain, but the need for local services in and around the enlarged military camps was so obvious that assistance was readily given by the authorities. All the company's single-deck buses were used for ambulance purposes, and it is interesting to record that the first wounded to arrive from Mons were carried in one of these.

After the war the company devoted its attention to passenger carrying exclusively, and by 1921 some 40 buses and 7 charabancs were in use. These were working over a wider area than before the war, for, apart from the establishment of new routes, the company had enlarged its area eastwards by absorbing the Guildford & District Motor Services Limited. The early routes of that company, which was incorporated on March 12, 1914, were from Guildford to Merrow, and Guildford to Ash, where a connection was made with the A. & D. buses to Aldershot. In April, 1915, the company transferred control of its business to the A. & D. and a through Aldershot-Guildford service was inaugurated. For some years the Guildford & District Motor Services Limited retained its corporate identity, but under A. & D. control, and during this period worked a notable service between Guildford and Leatherhead via Dorking. This operated from May, 1915, to December, 1916, but was then suspended owing to wartime restrictions. It was resumed in September, 1919, between Guildford and Dorking only, for in the meantime the A. & D. had entered into an agreement with the L.G.O.C. defining their spheres of operation and fixing Dorking as a boundary town.

By the summer of 1927, the A. & D. fleet had risen to 140 buses—mostly of Dennis make—which were working on 43 routes; in addition, there were 18 charabancs available for private hire. So far the company's passenger services had all been of the stage carrier type, but in January, 1928, limited-stop coach operation was begun by the opening of a service between Bordon and London, via Farnham, Aldershot, and Farnborough; a Camberley-London service followed on February 13. After about three months of experimental working, a comprehensive scheme of such routes was introduced on April 25, 1928, and the London Coastal coach station was selected as the terminus. These have been steadily developed, and the Farnham-London route was further strengthened by the acquisition on October 27, 1934, of the competing Farnham Blue Coaches.



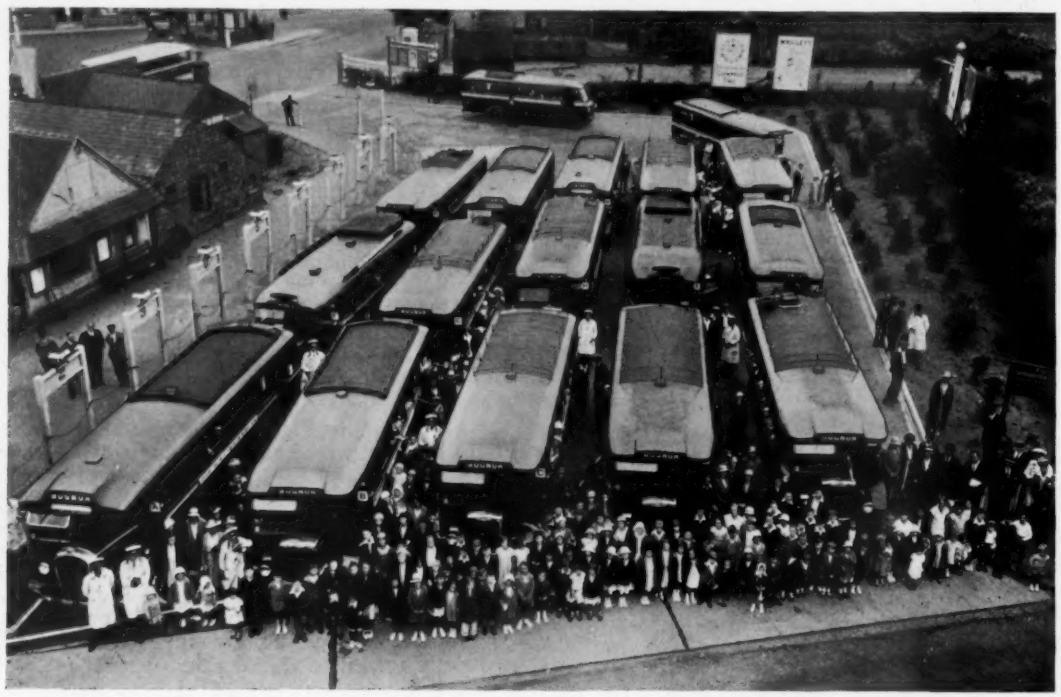
Towards the end of 1929 the Southern Railway offered the A. & D. shareholders 26s. 6d. a share, and bought about one third of the shares; the railway shareholding is now exactly equal to that of Tilling & British Automobile Traction Limited. January 1, 1930, was an important date in the history of rail and road co-ordination, for on that day working agreements with the Southern Railway came into force on the systems of five large bus companies, of which the A. & D. was one. As with other companies, detail work in connection with co-ordination is carried out by a standing joint committee comprising bus and rail representatives. During that summer (1930) the fleet reached a strength of 236, composed of 160 single-deck buses; 42 double-deckers (21 with covered tops); 19 saloon coaches; and 15 charabancs.

The Company's Present Area

The A. & D. area was slightly contracted on the formation of the London Passenger Transport Board, for the agreed boundary line was not identical with the old area-agreement line fixed with the old L.G.O.C. The territory transferred to London Transport was that east of a line through Guildford and Ewhurst, and the arrangement involved London Transport taking over, on August 2, 1933, three routes (Guildford-Merrow, Guildford-Ewhurst, and Guildford-Dorking), six buses, and the Ewhurst garage. In addition to this boundary, which, of course, has statutory force, the A. & D. has area agreements with its neighbouring and associated companies defining respective spheres of influence. These are with the Southdown Motor Services Limited, Hants & Dorset Motor Services Limited, and Thames Valley Traction Co. Ltd. The A. & D. area is bounded by a line through Horsham, Wisborough Green, Petworth, Midhurst, Petersfield, Winchester, Basingstoke, Hartley Row, Bagshot, Sunningdale, Egham, Chertsey, Weybridge, Woking, Guildford, and Ewhurst. As will be seen from the map, however, in two cases services are

worked considerably beyond this area. These are to Reading and Bognor, and the through workings of A. & D. vehicles give useful facilities without changing. Moreover, under a friendly understanding with Venture Limited, which works services around Basingstoke, Andover, and Whitchurch, competition has been avoided between the A. & D. and Venture companies.

The present A. & D. fleet, all of which is finished in a neat sage-green livery, comprises 161 single-deck buses; 43 double-deckers; and 42 coaches; a total of 246 vehicles. These work over some 500 route miles. Although many of the districts served are towns and residential parts, the area includes some delightful scenery at such well-known spots as Frensham Ponds, the Devil's Punch Bowl, Hindhead, and Waggoners Wells, all of which are made easy of access by bus, and the company assists tourists by the production, free of charge, of an illustrated guide to places of interest.



The bus station at Aldershot with a crowd of young holidaymakers about to leave for Bognor

The present Chairman, Mr. Sidney E. Garcke, has been a director of the company since its formation in 1912, and at the annual meeting in July last he reviewed briefly the policy and success of the past twenty-five years in words which aptly summarise the considerable variations in fortune to which the bus industry is liable. He said "The bus industry is a profitable one, but the risks of the business are sometimes lost sight of. They may be brought to mind by recalling that in the case of this company there have been four occasions in the 25 years of its life when the dividend has been passed. It is a business very responsive to trade depression, and when the revenues sink below the cost line the latter cannot be adjusted quickly, if at all. Many of the individual items of working cost are quite outside the control of the directors, such as taxation, which has increased enormously in recent years, and fuel, an almost entirely imported article. It follows, therefore, that if from time to time we have to face a shrinkage in our revenue, and cannot in practice adjust the working costs to meet it, our margin in good times must be sufficient to enable us to carry over the bad spots in our career. If we spoil our dividend record we damage our ability to raise additional capital when needed, and it is only possible to carry on an important public enterprise with efficiency when it is associated with average fair prosperity. Although this is the third year that it has been possible to recommend a distribution at the rate of 8 per cent., the average dividend for the past 10 years is under 6½ per cent. We have a responsibility to the travelling public, to our employees, and to our shareholders. If, growing accustomed to the improved results of the last year or so, we were to distribute too much, either by way of dividend or by making too many concessions to the travelling public or to our employees, we might find ourselves in the position of being forced to retrace our steps, which would naturally be resented by the three parties to the enterprise. As prudent directors we prefer to maintain an even course, giving reliable and good service to the public at a fair charge; paying our people what are, for the provincial areas, good rates; and making a fair but not extravagant return to our shareholders."

NEW DAZZLE RESTRICTIONS.—The new road vehicles lighting regulations which came into force on October 3 should make for greater night safety on the roads throughout the country, for the arch bugbear of dangerous dazzle is at last to be controlled effectively by anti-dazzle devices conforming strictly to conditions that seem to permit of no evasion. The lighting systems of most cars manufactured prior to 1933 will have to be converted to comply with the new regulations, and the General Electric Co. Ltd. has prepared an instructive leaflet on how best to make the necessary adjustments in a cheap and effective manner. The schematic diagrams show how easily existing wiring circuits on various cars can be converted to meet the new regulations.

EUROPEAN TIMETABLE CONFERENCE

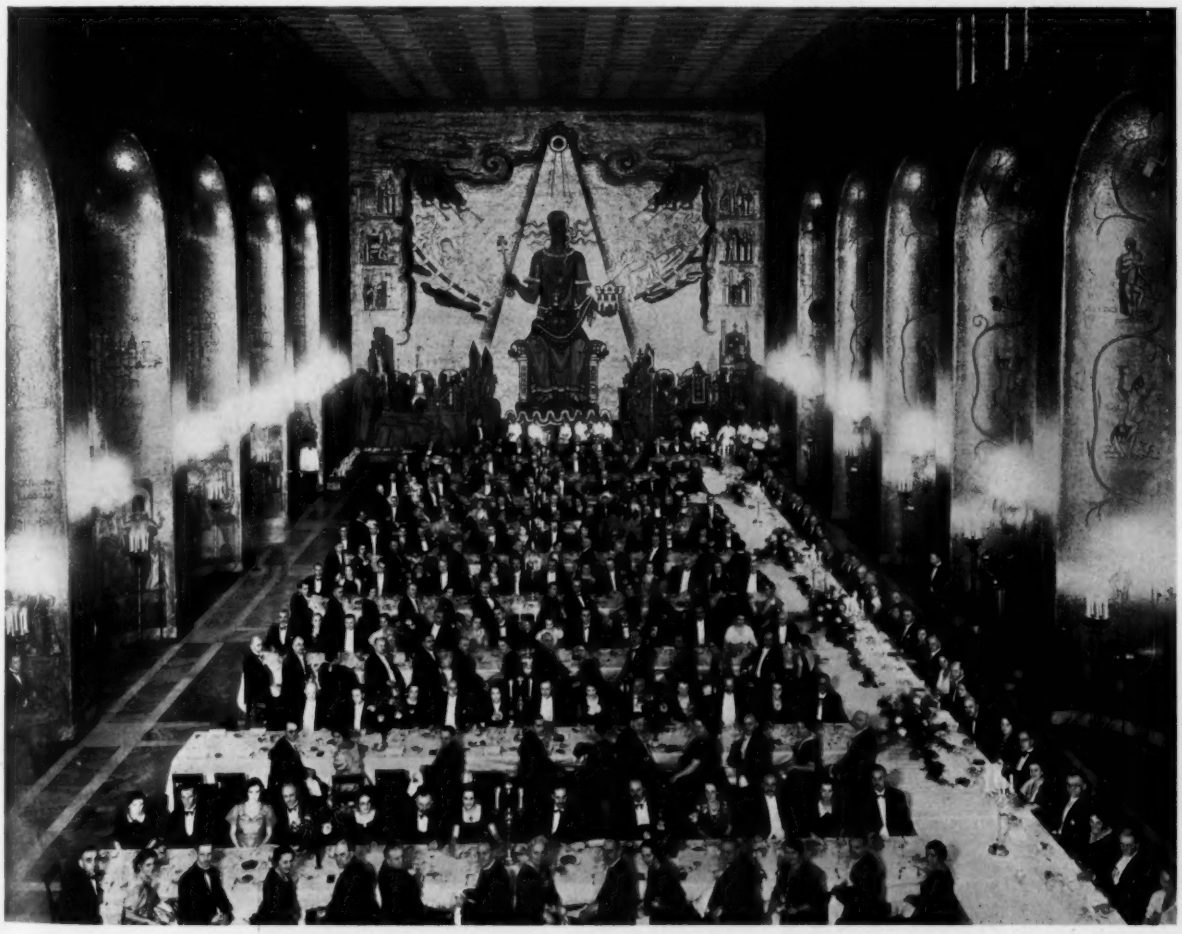
Europeiska tidtabells-och vagnkonferensen
Europäische Fahrplan- und Wagenbeistellungskonferenz
Conférence européenne des horaires et des services directs

The annual European Timetable and International Through Services Conference was held this year at Stockholm, from October 4 to 9, under the presidency of Herr A. M. Granholm, Chief of Administration of the Swedish State Railways. The Director General of the Timetable Conference, whose secretariat is located at Berne, is Herr Hans Etter, General Manager (Working and Construction), Swiss Federal Railways. The official languages used at the conference are French and German and the language of the country in which the conference is held. At a plenary session the invitation of the Hungarian State Railways that next year's conference should be held early in October at Budapest was accepted. Since the war, annual conferences had been held at Berne, Lucerne, Nice, Naples, The Hague, Baden-Baden, Prague, Vienna, Warsaw, Copenhagen, London, Brussels, Bucharest, Dubrovnik, Helsingfors, and Montreux-Territet.

The Swedish State Railways entertained the members of the conference and their ladies to a banquet in the Gyllene Salen of the Stadshuset, Stockholm, and the State and privately-owned railways arranged a number of attractive excursions for the delegates, including a full-day one on October 9 to Gripsholm, Skokloster, and Uppsala, and to Gothenberg and Trollhatten on the following day.

The work of the conference was fully described in an article which appeared in THE RAILWAY GAZETTE of November 15, 1929. Briefly, the representatives of all European railway administrations to or through whose systems international trains are run meet once a year for a week to arrange additions to, and alterations in, the timings of these trains, through coaches, or connecting services. Each country is located a table at the conference, and deals directly with the representatives of the adjoining countries. Numerous discussions and conferences take place during the week, and when these have been settled the decisions are signed by the representatives concerned and handed to the secretariat.

Obviously on account of their Continental services, the two British railways most directly concerned are the Southern and London & North Eastern. The countries represented at the Stockholm Conference were as follow, the number of delegates being shown in brackets after each country:—Austria (9); Belgium (17); Bulgaria (2); Czechoslovakia (6); Danzig Free City (1); Denmark (5); Estonia (3); Finland (4); France (20); Germany (45); Great Britain (10); Greece (2); Hungary (11); Italy (14); Jugoslavia (8); Latvia (2); Lithuania (4); Luxembourg (2); Netherlands (7); Norway (3); Poland (12); Portugal (0); Roumania (4); Spain (0); Sweden (7); Switzerland (20); Turkey (0); U.S.S.R. (1).



Photo] ***Banquet to delegates held in the Golden Hall of the City Hall, Stockholm*** [Centralen, Stockholm

Fig. 1—Original gantry erected in 1893, after removal of outgoing signals, showing double platform "homes" and "precaution" signals beneath

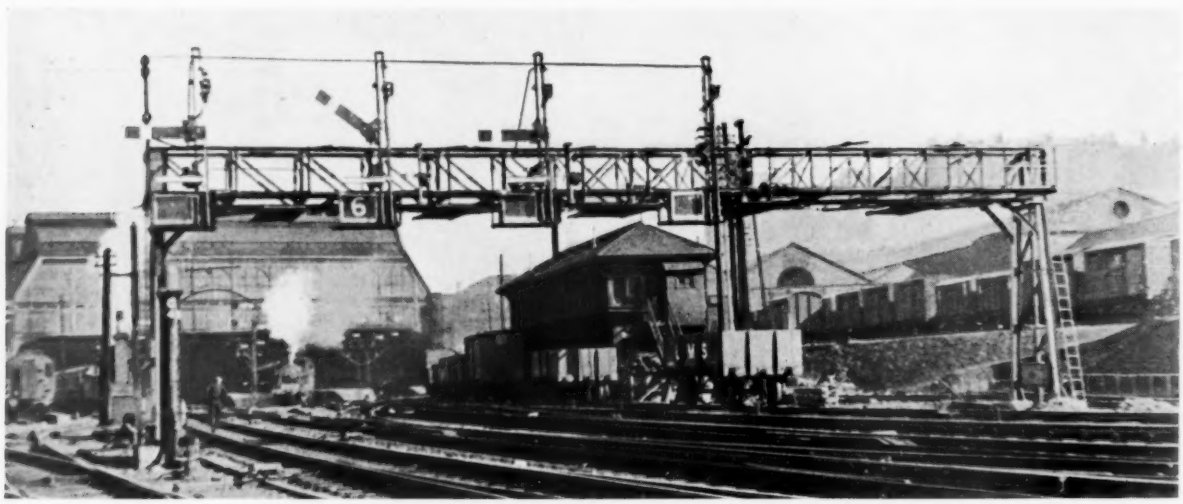


Fig. 2—The new upper quadrant home and draw-ahead signals, with route indicators

RESIGNALLING AT PRINCES STREET STATION, EDINBURGH, L.M.S.R. (*See page* 707)

Judges inspecting an attractive display at a station competing in the L.N.E.R. best kept stations competition
(*See page* 708)

RAILWAY NEWS SECTION

PERSONAL

INSTITUTION OF CIVIL ENGINEERS

The following are awards for papers read and discussed at ordinary meetings of the institution, or for papers published in the journal with written discussion, during the session 1936-37:—

The special thanks of the institution to:—

Mr. Raymond Carpmael, O.B.E., for his paper on "The Maintenance of Waterways to Harbours and Docks."

Telford Premiums to:—

Mr. F. W. A. Handman, C.B.E., M.Inst.C.E., for his paper on "The Lower Zambezi Bridge."

Mr. G. E. Howorth, M.C., B.Sc., M.Inst.C.E., for his paper on "The Construction of the Lower Zambezi Bridge."

An Indian Premium to:—

Mr. H. J. Nichols, D.Sc., M.Inst.C.E., for his paper on "Pre-stressing Bridge Girders."

A Webb Prize to:—

Mr. P. L. Henderson, Ph.D., M.E., Assoc.M.Inst.C.E., for his paper on "Some Development in Railway Carriage and Wagon Construction."

COLONIAL SERVICE STAFF CHANGES

Mr. L. M. Smart, C.B.E., General Manager, Gold Coast Railways, has been appointed General Manager, Federated Malay States Railways.

Mr. A. W. S. Greame, Chief Mechanical Engineer, Federated Malay States Railways, has retired from the Colonial service.

Mr. W. G. W. Wilson, Superintendent of Workshops, has been appointed Chief Mechanical Engineer, Nigerian Railway.

Mr. H. S. E. Vanderpant the Chairman of the London and Home Counties Traffic Advisory Committee is the Mayor-elect of Westminster for the coming civic year.

We note with regret the death, on October 13, of Dr. S. F. Tolmie, Premier and Minister of Railways in British Columbia from 1928 to 1933, at the age of 70.

We regret to announce the death, on October 12, of Mr. J. X. Murphy, a Director of the Great Southern Railways and of the Fishguard and Rosslare Railways and Harbours Companies.

Mr. Richard Edward Lloyd Maunsell, Chief Mechanical Engineer of the Southern Railway, who, as announced in THE RAILWAY GAZETTE of June 4, will retire on October 31, received his engineering training under the late Mr. H. A. Ivatt as a pupil at Inchicore (Great Southern & Western Railway, Ireland). He continued his pupilage on the Lancashire & Yorkshire Railway under the late Sir John Aspinall, and subsequently had experience in the works and drawing office at Horwich until he was appointed foreman in charge of the Blackpool District. In 1894 he was appointed Assistant District Locomotive Superintendent of the East Indian Railway, and in the course of the two years he spent in India was promoted to be District Locomotive Superintendent of the Asansol District. Returning to Ireland and the G.S. & W. Railway as Works Manager at Inchicore in 1896, Mr. Maunsell served in that capacity until appointed Chief Mechanical Engineer in 1911, on the retirement of Mr. Coey. In 1913 Mr. Maunsell was offered and accepted the position of Chief Mechanical Engineer of the South Eastern & Chatham Railway as successor to the late Mr. H. S. Wainwright at Ashford in 1913, and while in that position had heavy responsibilities during the Great War. He was appointed Chief Mechanical Engineer for locomotives, carriages, wagons, and road vehicles, of the Southern Railway on the formation of the group in 1923. Mr. Maunsell has on two occasions been President of the Institution of Locomotive Engineers, in 1916 and 1928-29, and was Chairman of the Chief Mechanical Engineers' Committee of the Railway Clearing House for the year 1935. He holds the rank of Lieutenant-Colonel in the Engineer and Railway Staff Corps, Territorial Army, and is a Master of Arts of Trinity College, Dublin, and C.B.E.

Photo] [*Lafayette*

Mr. R. E. L. Maunsell

Chief Mechanical Engineer, Southern Railway, 1923–37

Mr. R. H. Middleton, Chief Engineer of the Bombay, Baroda & Central India Railway, has recently left India on leave prior to retirement. He joined that railway in 1907 as an Assistant Engineer, after experience on the former London Tilbury & Southend Railway, and was promoted to be Executive Engineer ten years later. After acting as Deputy Chief Engineer on several occasions, he occupied that post substantively from 1930 to 1932, when he was appointed Chief Engineer. He also acted as Deputy Agent between 1929 and 1931. Among the important works with which he was closely concerned were the Silver Jubilee bridge over the Narbudda, the Borivli—Virar electrification, and the strengthening of the Jamna bridge at Agra.

INDIAN RAILWAY STAFF CHANGES

As a result of Mr. R. H. Middleton's proceeding on leave preparatory to retirement from the position of Chief Engineer, B.B. & C.I.R., the home board of that railway has now approved of the following promotions:

Mr. C. W. M. Collins, Engineer-in-Chief (Ajmer), to be Chief Engineer.

Mr. R. MacLean, Deputy Engineer-in-Chief, to be Engineer-in-Chief (Ajmer).

Mr. A. Watkins, Acting Engineer-in-Chief, to be Deputy Chief Engineer.

Mr. A. H. M. Campion, Acting Deputy Chief Engineer, to act as Deputy Engineer-in-Chief.

XUM

Mr. S. J. Hungerford, Chairman and President of the Canadian National Railway system and President of Trans-Canada Air Lines, who is visiting London this week, has had 50 years of service with the two great Canadian railway systems. He has held, in succession, important positions of responsibility in connection with the construction, operation, maintenance, and administration, and, in fact, it may be said that transportation has been his life work. Not only does he know and understand the problems of railroading, but he has made a close study of other forms of transport and the co-ordination of railway, highway, and air services. Mr. Hungerford's lengthy period of service has given him residence in seven of the nine provinces of the Dominion. He has lived and worked in the Maritime Provinces, in Quebec and Ontario, in each of the three Prairie Provinces, and in British Columbia. Likewise, he has served in the State of Vermont, U.S.A., where the National system operates the Central Vermont Railway. Born near Bedford, Quebec, in July, 1872, Mr. Hungerford entered railway service in May, 1886, as an apprentice in the locomotive shops of the South Eastern Railway, now a part of the Canadian Pacific system. Between 1891 and 1910 he held various positions with the Canadian Pacific Railway, including those of Master Mechanic of the Western Division, at Calgary, and Superintendent of the large locomotive and other shops at Winnipeg. He accepted the position of Superintendent of Rolling Stock, Canadian Northern Railway, in 1910, with headquarters first at Winnipeg and later at Toronto. In 1917 Mr. Hungerford became General Manager of Eastern Lines, C.N.R.; in 1918 he was appointed Assistant Vice-President of Operation, Maintenance and Construction; and in 1920 he was promoted to vice-presidential rank with the Canadian National Railways. When that system absorbed the Grand Trunk lines, he became Vice-President in charge of operation, maintenance and construction in February, 1923, the position he held until the resignation of Sir Henry Thornton in 1932, when he was appointed Acting President. He was also elected President of the Central Vermont Railway in that year, and was confirmed as President of the C.N.R. trustee board in 1934. With the replacement of this board by the new directorate in 1936, he became Chairman of the latter as well as President. When Trans-Canada Air Lines was organised in the spring of the present year, Mr. Hungerford was selected as President. In June last he was awarded the honorary degree of Doctor of Mechanical Engineering by the University of Vermont, in recognition of his notable work in restoring the Central Vermont Railway after the floods in 1927. On June 15 Mr. Hungerford was presented in Montreal with an honorary membership of the Engineering Institute of Canada.

Mr. S. J. Hungerford

Chairman and President, Canadian National Railways

Air-Marshal Lord Trenchard has been elected to the board of the Rhodesia Railways Limited.

Mr. W. E. Turnbull, who, as announced in our issue of July 16, has been appointed Chief Traffic Manager—and is also at present Acting Assistant General Manager (Commercial)—South African Railways and Harbours, was born in 1879, at Whitehaven, Cumberland. In 1893 he joined the former London & North Western Railway, and served as a clerk at stations in the West Cumberland dis-

Mr. W. E. Turnbull

Appointed Chief Traffic Manager, South African Railways and Harbours

Mr. H. Laird

Divisional Accountant, North Eastern Area, L.N.E.R., 1923-27

Mr. F. O. Cartwright

Appointed General Manager, Buenos Ayres Central Railway and Associated Companies

trict. Seven years later he went out to South Africa, joining the Natal Government Railways as a clerk in the stationmaster's office at Pietermaritzburg in August, 1900. Mr. Turnbull was appointed clerk in the General Manager's Office at Durban in 1902, and three years later became Staff Clerk in that office. On the formation of the Union, and amalgamation of the various systems to form the South African Railways in 1910, he was appointed Staff Clerk at headquarters, Johannesburg, and was promoted to be Principal Staff Clerk three years later. His next appointment was as Principal Clerk, Rolling Stock Section, headquarters, Johannesburg, in 1914, and in 1917 he was promoted to be Assistant Superintendent (Commercial & Operating), Divisional Superintendent's Office, Kimberley. Two years later Mr. Turnbull was transferred in a similar capacity, but for operating only, to East London, where he remained until, in 1925, he returned to Durban as Assistant Superintendent (Operating), Assistant General Manager's Office; in the following year he assumed the duties of Superintendent (Commercial) in that office. In 1928 he was transferred to the System Manager's Office, Cape Town, with the same designation. Mr Turnbull was successively appointed System Manager at Kimberley in 1932, at Johannesburg in 1934, and at Durban in 1935, but at the close of the following year he went to headquarters as Assistant Chief Traffic Manager. His appointment as Chief Traffic Manager dates from July 1 last.

Mr. H. Laird, Divisional Accountant, North Eastern Area, L.N.E.R., retired on September 30, after 48 years' service on that railway and its constituents. A native of Aberdeen, he was educated at Michie's Academy, Aberdeen Grammar School, and Robert Gordon's College. He entered the service of the Great North of Scotland Railway in 1889, as a junior clerk at the Waterloo goods station, and was transferred to the Goods Manager's Office in November of that year. In 1891 he was transferred to the Audit Office and in due course became Chief Assistant, being in 1907 appointed Chief Assistant in the Accountant's Department. Mr. Laird was appointed Accountant and Cashier of the Great North of Scotland Railway in 1918, and in 1921 was given control of the whole of the accounting, both revenue and expenditure, while retaining the position of Cashier. After the amalgamation of 1923, he became Divisional Accountant, North Eastern Area, L.N.E.R., and has remained in Newcastle-on-Tyne until his retirement. For the years 1919-20-21 Mr. Laird was Chairman of the Scottish Railway Accountants, and, when he retired, was Chairman of the Management Committee of the N.E.R. Bank of Deposits. As announced in our issue of August 20, Mr. T. Gaynor has succeeded Mr. Laird.

Mr. F. O. Cartwright has been appointed General Manager of the group of companies controlled by the Buenos Aires Central Railway & Terminal Company, namely, the B.A. Central Railway, B.A. Lacroze Tramways Company, and the B.A. Lacroze Light and Power Company, with which he has been connected for over nine years in the respective capacities of Chief Accountant, Treasurer, Administrative Superintendent and now General Manager, of the three latter concerns.

R.C.H. Superintendents' Conferences

At a meeting of the Superintendents' Conference held at the Railway Clearing House on Wednesday, Mr. Ashton Davies, Chief Commercial Manager, L.M.S.R., was unanimously elected Chairman of the Coaching Traffic Superintendents' Conference for the year 1938, and Mr. C. R. Byrom, Chief Operating Manager, L.M.S.R., was unanimously elected Chairman of the Operating Superintendents' Conference.

R.C.H. Goods Managers' Conference

At a meeting of the Railway Companies' Goods Managers' Conference held at the Railway Clearing House on Wednesday, Mr. W. M. Perts, Commercial Superintendent of the Southern Railway, was unanimously elected Chairman of the Conference for the year 1938.

Belgian National Railways Appointments

The Administrative Council of the Belgian National Railways, at a meeting on October 15, approved the following appointments in the headquarters office:—

M. Lamalle, Assistant General Manager, who has hitherto additionally carried out the duties of Traffic Manager, has relinquished these latter duties in order to devote himself exclusively to matters of general management.

M. Nachtergaele, Technical Secretary to the General Manager, has been appointed Traffic Manager.

M. Nolet de Brauwere van Steeland, Legal Advisor, has been appointed Assistant Personnel Manager.

Mr. H. Aidley has been appointed Secretary to the Railways Staff Conference in succession to Mr. Frank Gilbert, who has returned on promotion to the Southern Railway.

Mr. Aidley, began his railway career with the former London & North Western Railway in 1913 as a junior clerk in the stationmaster's office at Stockport, and later served at other stations in the Manchester District where he gained experience in passenger, parcels, and goods work. After serving with H.M. Forces in France and Italy, he returned to railway service in 1919, and acted as Relief Clerk until 1921, when he took up a position in the staff section of the District Superintendent's office at Manchester Exchange station. In November, 1924, he was transferred to the staff section of the Chief General Superintendent's Department at Derby, and remained there until June, 1933, when he was appointed to the position of Assistant Secretary to the Railways Staff Conference at Westminster, which post he has vacated to take up his present duties as Secretary to the conference.

Mr. R. H. Hacker has been appointed Deputy Assistant for Continental Traffic, Southern Railway, with effect from November 1 next. He is succeeded as Chief Clerk in the office of the Assistant for Continental Traffic by Mr. F. Gilbert, who, since 1928, has been Secretary to the Railways Staff Conference.

Mr. C. R. D. Tuckey, the well-known international lawn tennis player, has joined the sales staff of British Timken Limited.

It is with regret that we learn of the death, on October 11, of M. Maurice de Blonay, builder of the Chamonix-Montenvers and other rack and rope railways in the Alps.

Mr. John Philp, Secretary of Harland & Wolff Limited, has retired for reasons of ill-health. The company has appointed Mr. A. T. Marshall as Secretary, and Mr. John S. Baillie as Assistant Secretary.

Mr. A. V. Day, a member of the British Timken service staff, left England on Saturday, October 9, to inspect Timken equipped rolling stock in India, Java, and Egypt. During his tour in India, he will be attached to the staff of Guest, Keen, Williams Limited, of Calcutta, Bombay, and Madras. He will visit most of the principal railways.

Mr. D. P. C. Neave, who has been General Manager and Secretary of the Copper Development Association since its inception in 1933, is resigning at the end of the present year. Mr. G. W. Preston, the association's Electrical Engineer, has been appointed to succeed him as General Manager, and Dr. S. Baker, now Assistant Secretary, will become Secretary.

We regret to record the recent death in America of Mr. R. G. Peckitt, C.B.E., formerly Chief Mechanical Engineer, Egyptian State Railways. His early experience was in India, but in 1899 he went to Egypt, where he was largely responsible for reorganising the Mechanical Department of the State Railways. His fine career, latterly as Chief Mechanical Engineer, was unfortunately terminated by a murderous assault by a revolutionary agent, and he had to retire from the service prematurely, still suffering from the effects of this attack. He was 68 years of age at his death.

Railway Officers' and Servants' Association

The Rt. Hon. Lord Cadman, G.C.M.G., D.Sc., Chairman, Anglo-Iranian Oil Co. Ltd., and a Director of the Great Western Railway Company, presided at the Seventy-Sixth Anniversary Dinner of the Railway Officers' and Servants' Association, which was held at the Trocadero Restaurant, London, on Wednesday.

Those present included: The Hon. R. G. Lyttelton (Guest, Keen & Nettlefolds); Sir James C. Calder, C.B.E.; Brig.-General F. D. Hammond, C.B.E., D.S.O.; Lt.-Col. P. M. Brooke-Hitching; Messrs. H. Leslie Boyce, M.A., M.P.; N. B. Gulbenkian; F. Kroyer-Kielberg; John W. Chitty; J. W. Porter (W. F. Glover & Co.); D. Denis Williams (Henry Williams Limited); G. Rollings-Smith and F. W. Tipton (Thames Steam Tug & Lighterage Company); Colonel Miles Backhouse, D.S.O., T.D.; Messrs. R. B. Glassborow (Provident Mutual Life Assurance Association); J. A. Kay (Editor, THE RAILWAY GAZETTE); John Reid (Dunlop Rubber Company); T. Potter (Gloucester Foundry Company); S. Bolton, Treasurer; and A. T. Reynolds, Secretary.

Great Western Railway.—Sir Ralph Cope, Chief Accountant; Messrs. R. Carpmael, Chief Engineer; J. F. M. Taylor (Plymouth); G. Penney (Superintendent of the Line's Office).

Southern Railway.—Messrs. Charles Sheath J.P. (Director); T. E. Brain (Assistant Secretary); Lt.-Col. C. J. Francis, C.B.E. (Stores Superintendent); Messrs. R. G. Davidson (Accountant); T. E. Chrimes (Assistant Divisional Running Superintendent); H. Barnden; W. Envers (Stationmaster, Victoria); H. E. Greenfield (Stationmaster, Waterloo); E. Card, M.B.E. (Stationmaster, London Bridge); A. J. Trewren (Stationmaster, Cannon Street).

London & North Eastern Railway.—Messrs. A. Gregory (District Passenger Manager, Liverpool Street); F. C. Wilson (District Superintendent, Stratford); F. Warriner, M.B.E., (District Superintendent, King's Cross); E. F. Greenfield (District Superintendent, Norwich); P. Syder (London City Manager, Broad Street); H. C. R. Calver (Stationmaster, Liverpool Street); G. F. Lofting (Parcels Agent, King's Cross).

Lord Cadman proposed the toast of "Prosperity to the United Kingdom Railway Officers' and Servants' Association." After quoting de Rochefoucauld's cynical epigram: "The misfortunes of friends do not displease us," he went on to stress the deep and serious significance of real misfortunes, with particular reference to the risks run by railway servants (often resulting in incapacitation and even loss of life) in contributing to the high standard of safety enjoyed and appreciated by railway travellers. On the understanding that self-help is one of the best principles for the conduct of life, the association had issued a special appeal to members to assist the numerous servants who could not afford to make provisions for accidents incurred in service. As a result of the pressing claims upon it, the association's expenditure had exceeded revenue by £200, but he trusted that the 1937 accounts would bear a different aspect; administration expenses were unavoidably heavy, but he was satisfied that these had been reduced to the minimum possible. He was particularly pleased to couple with the toast the name of Mr. F. C. Wilson, Chairman of the Committee of Management, who, as District Operating Superintendent at Stratford, L.N.E.R., combined a highly successful railway career with a splendid record of devoted service to a great cause.

Mr. F. C. Wilson, in replying, remarked that in no case had help been refused by the Association to non-members, although preference was naturally given to members. The association had a long list of annuitants, with 25 railway servants on the waiting list, and £20 per annum went a long way towards amplifying small pensions for the many who had retired before State benefits accrued, and who had not qualified for railway pensions. He was very anxious to put another 25 on the list.

Mr. Hubert C. R. Calver, Stationmaster, Liverpool Street, L.N.E.R., in proposing the toast of "The Visitors," referred to the inimitable manner in which this annual festival brought together friends, helpers, and railway servants. As the stalwart friend of the committee, he was glad to welcome especially Lt.-Col. C. J. Francis of the Southern Railway, and Mr. Percy Syder, of the L.N.E.R., who invariably vied with one another as to who could hand in the larger list; Mr. W. Enves, Station Superintendent, Southern Railway, Victoria, doyen of stationmasters in the London area, was another outstanding helper.

Brig.-General F. D. Hammond, in replying, referred to his railway experiences and impressions in various parts of the world. When visiting South America this year he had been greatly impressed by the manner in which a comparatively small community of British railwaymen carried on their work and upheld the great tradition of their home land and the training acquired therein. The growth of the oil industry, in which Lord Cadman had played such a prominent and distinguished role, convinced him that, despite objections from certain prominent railway engineers, the use of the internal-combustion engine would continue to extend. General Hammond concluded by a eulogistic reference to the late Secretary of the Association, Mr. Alfred James, whose absence he felt all must deeply regret.

Col. Miles Backhouse proposed the health of the chairman, and in replying Lord Cadman said he was amazed at the exceedingly generous way in which his appeal had been met. The figures announced by the Treasurer of the association showed a total of £1,800 contributed, which was the highest for 5 years, and £500 up on the previous year.

Institution of Mechanical Engineers: Annual Dinner

Sir Thomas Inskip, Minister for Co-ordination of Defence, was the chief guest at the annual dinner of the Institution of Mechanical Engineers, on Friday, October 15. In proposing the toast of the institution he devoted his speech to a denial that the country was near the end of the present period of comparatively-full employment. He stated that in the eight months to August of this year there was an export of machinery of over £31,000,000, showing an advance upon the corresponding figures of £27,000,000 for 1936 and £25,000,000 for 1935. Since machinery represented almost entirely capital expenditure, it scarcely seemed as if the world expected a slump so soon.

Sir John E. Thornycroft, President, in replying to the toast, referred to the serious shortage of skilled mechanics which the engineering industry had suffered as a result of the depression. He suggested that in preparing for the country's security it was as important to keep the battalions of skilled craftsmen and mechanics up to full strength as the other battalions, and the only way to do this was to ensure that factories were kept employed.

Mr. Asa Binns proposed the toast of Engineering and Science and spoke of the growth of industrial research. A remarkable instance of the way in which engineers and scientists worked together nowadays was afforded by the General Discussion on Lubrication and Lubricants just concluded, which had been organised by the institution. The discussion had gathered together men engaged in scientific research into the subject from all parts of the world, many of whom were present at the dinner that evening.

Sir William H. Bragg responded to the toast and spoke of the dependence of scientific knowledge on the development of new instruments, very often mechanical instruments. He referred also to the General Discussion on Lubrication and the part played by X-ray methods in lubrication research. X-rays and electron diffraction had given us knowledge of the molecular structure of lubricants, while the microscope in the hands of the metallurgists had provided knowledge of the grain structure of metals. Between these two extremes there was a region of knowledge to be filled in, and it was there that great progress could be expected in the next ten or twenty years, particularly in connection with the oil of lubrication.

Mr. David E. Roberts proposed the toast of "The Guests," which was responded to by Professor George Karelitz, of Columbia University, New York, who extended greetings to the institution on behalf of the American Society of Mechanical Engineers. The Secretary also read a letter from the society extending a cordial invitation to the institution to participate in a Joint Meeting of the two societies in New York in September, 1939, at which time there would be a World Exposition in New York.

Resignalling at Princes Street Station, Edinburgh, L.M.S.R.

(*See illustrations on page* 702)

Some important alterations have recently been completed by the L.M.S.R. to the signalling at Princes Street station, Edinburgh, originally installed by the Caledonian Company in 1893. There are 7 passenger platforms, some carriage sidings, a horse and carriage dock siding and three running lines, 1 up (departure) and 2 down. No. 1 down line is used exclusively by empties and light engines. The whole is controlled from one signal box. Lack of space prevented improvements being made to the layout and a wide overbridge west of the box prevented drivers from getting a distant view of the original platform home signals (Fig. 1), which, together with the starting signals, were placed on a large gantry at the platform ends that at one time carried 45 arms. There were 2 home signals to each platform, the top reading from No. 1, the second from No. 2, down line. Below was a ringed fishtailed arm known as the "precaution" signal. When "off" it indicated that the line was clear to the buffer stops, when "on" that there were vehicles already in the platform.

The starting signals have now been placed on posts at the ends of the platforms and the large gantry abolished. New upper quadrant home and draw-ahead signals, with roller blind route indicators, have been provided on a gantry west of the box for the down lines and for a siding which runs into the No. 1 down line (Fig. 2).

A setting back signal with route indicator has also been provided for the up line. To enable drivers to get as good a view as possible under the overbridge these signals and route indicators have been fixed low down on the face of the gantry. Track circuiting has been provided in the platform lines and electric point detection throughout the yard.

New Cable Development

Manufacture has been begun at Hebburn-on-Tyne of a new type of electrical cable which has advantages that are expected to appeal to railway engineers. It employs mineral material as insulation, enclosed in a metallic sheath, and is remarkably robust as well as fireproof to an extent that cannot be approached by more conventional types. Cable of the new construction has passed out of the experimental stage in France, where it has been used already by the P.L.M. on certain railcars and on the Est for signalling equipment.

The British factory, owned by Pyrotenax Limited, was opened on October 12 by the Rt. Hon. Viscount Ridley in the presence of a representative gathering of over a hundred persons. At the subsequent luncheon Sir Brograve Beauchamp, M.P., the Chairman of the company, who presided, said the new factory owed a good deal to the ready help given by the associated companies, A. Reyrolle & Co. Ltd., and Imperial Chemical Industries Limited. Manufacturing rights had been secured for the British Empire and already some additional employment had been brought to the North-East Coast. He read a letter of apology from Professor W. M. Thornton, in which that eminent electrical worker gave it as his opinion that the claims made for the new construction would be fully substantiated in practical experience.

Viscount Ridley congratulated the promoters of the enterprise on their courage and initiative and said that the new product was one of the greatest technical interest and promise. The factory had been erected without Government or public assistance of any kind and he was glad to know that cables made at Hebburn had already been used in a number of important buildings and factories.

The construction is at present employed only for low-voltage cables and wires, in which a wide range of sizes can be supplied both in single and multicore types. Hydrated magnesia is used as insulation, being highly compressed in the process of manufacture and providing a stable and mechanically robust material within a copper or other metallic sheath. The finished cables can be bent readily and need to be supported only at relatively long spacings. They are jointed and coupled at fittings by simple devices which adequately maintain the continuity of the sheathing. Owing to the good thermal conductivity of the compressed insulation the current ratings can be increased in comparison with ordinary types and in general only the voltage drop has to be considered. Further, the insulation is neither inflammable nor does it support combustion, so that the cables are unaffected by relatively high temperatures. This was demonstrated to the visitors at the official opening of the factory by the exposure of several types of cable—some in conduit—as well as Pyrotenax to the effects of a fire kindled beneath them; all other types failed, but the Pyrotenax was uninjured and used for successive demonstrations. The robustness of the new cable was also shown by the mechanical punishment it was possible to give it before the cores short-circuited. There would appear to be many advantages in the use of Pyrotenax in railway shops, on station and hotel premises, and on rolling stock. Savings are claimed to be possible in installation costs.

RETIREMENT OF MR. T. F. DAY, DISTRICT GOODS MANAGER (L.N.E.R.), SHEFFIELD.—At the September meeting of the West Riding (Yorkshire) Local Officers' Conference, it was announced that Mr. T. F. Day, District Goods Manager, Sheffield, L.N.E.R., would shortly be retiring from the railway service. The Chairman, Mr. Cuthbert Jones, District Goods and Passenger Manager, Sheffield, L.M.S.R., after paying tribute to the valuable work performed and the co-operative services rendered by Mr. Day to this body, voiced the unanimous appreciation of the conference in expressing sincere regrets at the parting. The Chairman felt that such an opportunity could not be allowed to pass without showing in some tangible form the real regard with which Mr. Day was held by members of the conference, and he asked his acceptance of a gold wristlet watch as a reminder of the very happy associations during his membership of the conference.

Mr. Day, in accepting the watch, said how much he appreciated not only the gift, but the spirit behind it, and added that it would be a constant reminder to him of the many friends he had on this West Riding Local Officer's Conference; he hoped to follow its work with pride and interest during the years of his retirement.

DINNER TO SIR H. WALKER AND MR. G. SZLUMPER.—In connection with the respective retirement from and appointment to the general managership of the Southern Railway, Sir Herbert Walker, K.C.B., and Mr. Gilbert S. Szlumper, C.B.E., were entertained to dinner by the officials of the Docks & Marine Departments of the railway on board the T.SS. *St. Briac*, at Southampton Docks, on Friday last, October 15. Mr. R. P. Biddle, the Docks & Marine Manager, presided. During the proceedings Sir Herbert Walker received a presentation from the officials of the Docks & Marine Departments.

INDIAN MINISTER OF RAILWAYS AND DELEGATE AT INDO-BRITISH TRADE NEGOTIATIONS TO RETURN TO INDIA.—Sir Muhammed Zafrullah Khan, Minister of Commerce and Railways in India and a member of the Governor-General's Executive Council, who is the official Indian delegate in the trade negotiations between Great Britain and India in London, has been instructed by the Government of India to return to that country. He will, however, continue negotiations with the British Government from India, with the advice of his non-official advisers, who have preceded him in returning to India.

NOTES AND NEWS

New Bulgarian Railway Opened.—King Boris drove the engine of the first train from Dupnitza, 22 miles south of Sofia to Gornia Djumaia, in the Struma Valley, a distance of about 20 miles. This is a further link in the through standard-gauge connection between Bulgaria and the Greek Government Railway connecting Salonika with Alexandrople. An article (with map) outlining the progress of the Bulgarian State Railways was published in our issue of June 26, 1936.

Earls Court Station.—Earls Court station, specially reconstructed to serve the Earls Court Exhibition, was placed in full service for the first time on October 14. At peak periods passengers have been arriving at the exhibition by the subway under Warwick Road at the rate of 75 a minute. At the same time 75 passengers a minute were leaving the Warwick Road exit from the station for the exhibition. Even at the busiest times there has been no crowding or congestion at the station. The station works were described in THE RAILWAY GAZETTE of September 17.

Public Schools in L.M.S.R. Poster Art.—Famous public schools of England and Scotland are featured in a new series of posters, for display both in this country and overseas, which have been commissioned by the L.M.S.R. from Norman Wilkinson, P.R.I. In addition to depicting the school itself, every poster bears the crest both of the school and of the L.M.S.R., and carries below the picture a letterpress caption giving a brief history and other particulars of interest about the school. The posters are in two sizes—quad royal and double royal—and from 2,000 to 3,000 copies of each are being issued, according to size. Famous schools which are to be portrayed in this new series are Bedford, Berkhamsted, Fettes, Harrow, Manchester Grammar School, Oundle, Repton, Rugby, St. Pauls (London), Sedbergh, Shrewsbury, Stonyhurst, Stowe, Uppingham, and Westminster.

One of Mr. Norman Wilkinson's "public schools" posters

Suspension of Train Services in Manchukuo.—A widespread suspension of train services on the Manchukuo railways came into force on Tuesday, according to a Reuters message from Peiping. This drastic action applies to as many as 52 trains, and even includes the bi-weekly service between Harbin and Manchouli in connection with the Trans-Siberian service. Passenger travel is therefore considerably restricted throughout the country. The official explanation is that this is a temporary measure to facilitate the transport of Manchurian produce.

Düsseldorf Exhibition Closed.—Nearly 7,000,000 persons had visited the Düsseldorf Exhibition "A Nation At Work," when it closed on October 17. Many of the great exhibition halls have been sold and will be re-erected elsewhere. The illuminated fountain has been sold to a foreign country and will be leaving Germany. Schlageter Town, the modern settlement which was built for the exhibition, will remain, and the houses have, in fact, been occupied since before the opening of the exhibition. The site will be preserved as an exhibition ground for the city of Düsseldorf.

Cordoba Central Railway.—With a view to ending the strike situation on the Cordoba Central Railway, the Argentine Minister of Public Works, Dr. Alvarado, has ordered the management to restore the services within 48 hours, on pain of penalty, and to instruct the staff accordingly. Orders have also been issued, according to Reuters, to the Entre Rios and the Argentine North Eastern Railways similarly to advise their staffs, in view of reports that they intend to engage in similar strikes. As announced last week, a dispute had arisen on the Cordoba Central Railway over the wage cuts under the Presidential award of 1934.

Royal Journey in Fog.—Despite one of the thickest fogs ever known, covering the whole journey from London to Goole, the special train conveying the King and Queen, on Monday night, which left King's Cross punctually at 10.40, reached Marshland sidings, Goole, the following morning, only 15 minutes after it was due, namely at 2.55. The engine was No. 4496 *Golden Shuttle*, in charge of Driver Sheen, of King's Cross. After staying at Marshland sidings for the rest of the night, the train was run to Hull, and when the ceremonies there were over left that city at 2.30 for York, which was reached punctually at 3.30. The locomotive used from Marshland sidings to Hull and from Hull to York was No. 4780, *The Snapper*, of the "Green Arrow" 2-6-2 type. Their Majesties were received on their arrival at King's Cross, by Lord Burghley, a Director, and Sir Ralph Wedgwood, Chief General Manager of the L.N.E.R. Mr. V. M. Barrington-Ward, Superintendent (Western Section), and Mr. C. J. Selway, Passenger Manager, Southern Area, L.N.E.R., travelled on the train.

French National Railways Company and the Est.—Shareholders of the Eastern of France Railway Company have formally approved the agreement for the transfer of the system to the French National Railways Company. Under the agreement the Est Company is to receive from the National Company, until 1955, annual payments corresponding to statutory interest, guaranteed dividends, and redemption of shares, and is also to receive 250,384 B shares of Fr. 500 each in the National Company, which will bear interest at 6 per cent. as from 1955. The terms of the agreement were set out in THE RAILWAY GAZETTE of September 10 last, at page 453.

L.N.E.R. Locomotive Inspector Killed.—At the adjourned inquest on October 15 on Mr. C. E. Skinner, locomotive inspector, L.N.E.R., who was fatally injured on October 8 on the footplate of the up Coronation express as it passed the corresponding down train near Northallerton, the jury found that the deceased was accidentally killed by a blow on the head from some unidentified foreign object. A lookout and side cab glass were broken on the engine, 27 ventilator vanes knocked off the coaches, 57 bent and 2 sliding shutter ventilators broken. Two windows were broken in the first vehicle of the down train. Medical evidence said deceased was probably hit by some blunt metallic object, but nothing was definitely established as to the cause of the mishap.

L.N.E.R. Best Kept Stations Competition, 1937.—The results of the L.N.E.R. Best Kept Stations Competition for 1937 have now been announced. In the Southern Scottish Area, special class awards were made to Burgh-by-Sands, Lennoxtown, and St. Monance. Twelve stations received first class awards. Of the competing stations in the North Eastern Area, special class awards were gained by Egton, Heddon-on-the-Wall, and Wharton, while 13 stations received first class awards. In the Southern Area, Appleby, Trimley, and Willoughby on the G.C., G.E., and G.N. Sections respectively, received special class awards; and five, twelve, and eight stations on these respective sections obtained first class awards. Of the joint lines, which had their own

arrangement of class awards, Gayton Road, Chesham, and Plumbley gained first places on the M. & G.N., Met. & G.C. and C.L.C. systems, respectively. As recorded in our issue of August 20 last, the L.N.E.R. arranged for eight excursions to be run during September from large towns in the North of England to various wayside stations where there were striking floral displays. These trains halted for a few minutes at selected stations *en route* to enable passengers to alight and inspect them. The illustration on page 702 shows the judges inspecting a pleasing display at a competing station.

Railway and Other Reports

Antofagasta (Chili) & Bolivia Railway.—The directors have decided to pay, on December 14, on account of arrears, a dividend of 2½ per cent. on the 5 per cent. cumulative preference stock. This distribution will leave arrears from July, 1934.

West of India Portuguese Guaranteed Railway.—An interim dividend declared of 2½ per cent. plus a bonus of ¾ per cent. will be paid on January 15 to holders registered on December 31. A year ago the interim dividend declared was 2½ per cent., with a bonus of 1 per cent.

Forthcoming Meetings

Oct. 27 (*Wed.*).—**Buenos Ayres Great Southern Railway Co. Ltd.** (Annual General), River Plate House, Finsbury Circus, E.C.2, at noon.

Oct. 27 (*Wed.*).—**South Indian Railway Co. Ltd.** (Annual General), 91, Petty France, Westminster, London, S.W.1, at noon.

Oct. 27 (*Wed.*).—**Assam Railways & Trading Co. Ltd.** (Ordinary General), Winchester House, Old Broad Street, E.C, at noon.

Nov. 3 (*Wed.*).—**Buenos Ayres Western Railway Limited** (Annual General), River Plate House, Finsbury Circus, E.C.2. at noon.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 41st Week			Totals to Date		
	1937	1936	Inc. or Dec.	1937	1936	Inc. or Dec.
	£	£	£	£	£	£
L.M.S.R. (6,870¼ mls.)						
Passenger-train traffic...	488,000	466,000	+ 22,000	21,862,000	21,028,000	+ 834,000
Merchandise, &c. ...	558,000	528,000	+ 30,000	20,143,000	19,552,000	+ 591,000
Coal and coke ...	264,000	253,000	+ 11,000	10,355,000	9,768,000	+ 587,000
Goods-train traffic ...	822,000	781,000	+ 41,000	30,498,000	29,320,000	+1,178,000
Total receipts	1,310,000	1,247,000	+ 63,000	52,360,000	50,348,000	+2,012,000
L.N.E.R. (6,315 mls.)						
Passenger-train traffic...	316,000	295,000	+ 21,000	14,303,000	13,674,000	+ 629,000
Merchandise, &c. ...	364,000	362,000	+ 2,000	13,786,000	13,311,000	+ 475,000
Coal and coke ...	270,000	250,000	+ 20,000	10,083,000	9,452,000	+ 631,000
Goods-train traffic ...	634,000	612,000	+ 22,000	23,869,000	22,763,000	+1,106,000
Total receipts	950,000	907,000	+ 43,000	38,172,000	36,437,000	+1,735,000
G.W.R. (3,738¾ mls.)						
Passenger-train traffic...	190,000	188,000	+ 2,000	9,199,000	8,941,000	+ 258,000
Merchandise, &c. ...	223,000	209,000	+ 14,000	8,194,000	7,853,000	+ 341,000
Coal and coke ...	115,000	107,000	+ 8,000	4,544,000	4,075,000	+ 469,000
Goods-train traffic ...	338,000	316,000	+ 22,000	12,738,000	11,928,000	+ 810,000
Total receipts	528,000	504,000	+ 24,000	21,937,000	20,869,000	+1,068,000
S.R. (2,157 mls.)						
Passenger-train traffic...	287,000	277,000	+ 10,000	13,695,000	13,016,000	+ 679,000
Merchandise, &c. ...	71,000	63,000	+ 8,000	2,549,500	2,597,000	− 47,500
Coal and coke ...	31,000	32,000	− 1,000	1,217,500	1,245,000	− 27,500
Goods-train traffic ...	102,000	95,000	+ 7,000	3,767,000	3,842,000	− 75,000
Total receipts	389,000	372,000	+ 17,000	17,462,000	16,858,000	+ 604,000
Liverpool Overhead ... (6½ mls.)	1,278	1,192	+ 86	53,551	49,125	+ 4,426
Mersey (4½ mls.) ...	4,273	4,225	+ 48	171,505	166,307	+ 5,198
*London Passenger Transport Board ...	574,300	566,400	+ 7,900	8,973,300	8,933,400	+ 39,900
IRELAND.						
†Belfast & C.D. pass. (80 mls.)	1,749	1,783	− 34	110,628	112,142	− 1,514
,, ,, goods	511	551	− 40	19,661	22,199	− 2,538
,, ,, total	2,260	2,334	− 74	130,289	134,341	− 4,052
Great Northern pass. (543 mls.)	9,750	9,300	+ 450	470,900	458,900	+ 12,000
,, ,, goods	10,250	10,400	− 150	386,150	400,850	− 14,700
,, ,, total	20,000	19,700	+ 300	857,050	859,750	− 2,700
Great Southern pass. (2,076 mls.)	31,309	30,401	+ 908	1,546,091	1,533,462	+ 12,629
,, ,, goods	49,463	51,716	− 2,253	1,685,640	1,719,588	− 33,948
,, ,, total	80,772	82,117	− 1,345	3,231,731	3,253,050	− 21,319

* 16th week (before pooling) † 42nd week

British and Irish Railway Stocks and Shares

Stocks	Highest 1936	Lowest 1936	Prices Oct. 20, 1937	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	64¼	45½	62¼	−1¼
5% Con. Prefce. ..	126½	116¾	116½	—
5% Red.Pref.(1950)	113	108½	110½	—
4% Deb.	119½	110½	106½	—
4¼% Deb.... ...	121	114	111	—
4½% Deb.... ...	129	121	116½	—
5% Deb.	141	134	128½	—
2½% Deb.... ...	79⅛	74	69½	—
5% Rt. Charge ...	136½	130	127½	—
5% Cons. Guar. ...	135¼	127¾	124	—
L.M.S.R.				
Ord.	35⅝	17	30¾	−¾
4% Prefce. (1923)	83	52½	74	—
4% Prefce. ...	92¾	81	83	−½
5% Red.Pref.(1955)	109¼	103¼	106	—
4% Deb.	111¾	105 9/16	102½	—
5% Red.Deb.(1952)	119⅝	115½	111½*	−1
4% Guar. ...	106¾	101⅝	100	—
L.N.E.R.				
5% Pref. Ord. ...	14	9	9½	—
Def. Ord.	7¼	4¾	4⅝	−⅛
4% First Prefce.	79¼	55¼	71	—
4% Second Prefce.	31⅞	18¼	28	—
5% Red.Pref.(1955)	100½	77¾	99½	+1½
4% First Guar. ...	104½	98¾	95½	—
4% Second Guar.	99	90	89	—
3% Deb.	85¾	79	77	—
4% Deb.	109¾	104½	101½	—
5% Red.Deb.(1947)	116¼	110½	108½	—
4½% Sinking Fund Red. Deb.	111½	107½	108	—
SOUTHERN				
Pref. Ord.... ...	98¾	82½	88	−1½
Def. Ord.	27⅝	20⅛	20	−¾
5% Pref.	120¾	118½	113½	—
5% Red.Pref.(1964)	119¾	115¼	113½	—
5% Guar. Prefce.	136	129½	124	—
5% Red.Guar.Pref. (1957)	120	115¾	114	—
4% Deb.	117 5/16	109½	105½	—
5% Deb.	140	134	126½	—
4% Red. Deb. 1962–67	116½	110	106½	—
BELFAST & C.D.				
Ord.	9	4½	4½	—
FORTH BRIDGE				
4% Deb.	107	105	101½	—
4% Guar. ...	107 5/16	104	100½	—
G. NORTHERN (IRELAND)				
Ord.	19½	9¾	15	+⅛
G. SOUTHERN (IRELAND)				
Ord.	63	41	32¼	—
Prefce.	65	46	38½	−1½
Guar.	97¼	81	73¼	—
Deb.	99¾	83¼	91	—
L.P.T.B.				
4½% "A" ...	127¾	121	113½	—
5% "A" ...	138¼	133½	124½	—
4½% "T.F.A." ...	111½	108½	105	—
5% "B" ...	131¾	123¾	117½	—
"C"	112½	93	79*	−2½
MERSEY				
Ord.	40¾	23	25½	—
4% Perp. Deb. ...	103	98	97	—
3% Perp. Deb. ...	78	74⅝	74½	—
3% Perp. Prefce.	68⅞	63¼	66½	—

* ex dividend

CONTRACTS AND TENDERS

4-8-4 + 4-8-4 Beyer-Garratts for Kenya & Uganda Railways

Beyer, Peacock & Co. Ltd. has received an order from the Crown Agents for the Colonies for six 4-8-4 + 4-8-4 Beyer-Garratt articulated locomotives. The locomotives, which will be the largest metre-gauge engines in the world, will develop a tractive effort of 46,000 lb. at 85 per cent. boiler pressure on an 11¾-ton axle load and with a coupled wheel of 4 ft. 6 in. dia. The boiler pressure will be 220 lb. per sq. in. The engines will have bar frames, Thermic syphons, roller bearings on all bogie wheels, grease lubrication, automatic firedoor, disc wheels, and exhaust injector, and will be designed so as to enable easy conversion to the 3 ft. 6 in. gauge.

Beyer, Peacock & Co. Ltd. has also received an order from the Rhodesia Railways Limited, to the inspection of Sir Douglas Fox & Partners, for six 2-8-2 + 2-8-2 Beyer-Garratt locomotives; these being an extension of an order for six similar engines already placed with this firm, as announced in our issue of August 6, 1937. These 12 locomotives will be practically identical with those supplied by the same firm to this railway in 1929.

The Société Franco-Belge de Materiel de Chemins de Fer has received an order from the Ivory Coast Railway (Côte Ivorie) for eight metre-gauge 4-8-2 + 2-8-4 Beyer-Garratt articulated locomotives, which will be manufactured in France in collaboration with Beyer, Peacock & Co. Ltd.

Whitelegg & Rogers Limited has received an order from the South African Railways & Harbours Administration for 16 engine sets of Ajax grease lubricating equipment for application to existing locomotives, also an order from Berliner Maschinenbau for Ajax grease equipment to be applied to four 4-6-2 type engines under construction for the Bikaner State Railway.

The Patent Shaft & Axletree Co. Ltd. has received an order from the Chinese Government Purchasing Commission to the inspection of Messrs. Sandberg for 20 sets of points and crossings for 85-lb. rails and 30 sets for 43-kg. rails for the Canton-Hankow Railway.

The Anderston Foundry Co. Ltd. has received an order from the Rhodesia Railways, to the inspection of Sir Douglas Fox & Partners, for 100 sets of 60-lb. B.S. 60 R. switches and crossings.

Fried. Krupp A.G., has received an order from the Mysore Government Railways, to the inspection of Messrs. Rendel, Palmer & Tritton, for 212 steel locomotive, carriage, and wagon tyres.

Alfred Herbert (India) Limited has received orders from the Indian Stores Department for two self-acting sliding, surfacing, and screw-cutting gap bed lathes.

The London Passenger Transport Board has signed the largest single order for trolleybuses it has yet placed. Leyland Motors Limited has received a contract for the supply of 200 trolleybus chassis and bodies. London Transport has now 1,254 trolleybuses in service or on order. At the same time, the Associated Manufacturers of Electric Traction Equipment Limited has received an order for 300 complete sets of electrical equipment for trolleybuses to be supplied under other contracts.

New Turntables for the L.N.E.R.

Cowans, Sheldon & Co. Ltd. has received orders from the L.N.E.R. for three 70-ft. turntables to be installed at London (Marylebone), Leicester, and Darlington locomotive depots. The new turntables at Marylebone and Leicester will enable larger engines to be used on the Great Central Section main line, whilst the new turntable at Darlington will accommodate the large streamlined Pacific engines used on East Coast route expresses.

The L.N.E.R. has placed contracts with J. White (Shopfitters) Limited, for the installation of a passimeter booking office at Gateshead East station; Weston & Co. (Manchester) Limited, for sheeting and glazing roofs and footbridge at York station; and Tarran Industries Limited, for the construction of new offices at Darlington, Bank Top.

The Hydraulic Coupling & Engineering Co. Ltd. has received an order from the South African Railways & Harbours Board for four size 14 scoop-tube couplings to transmit 17·5 h.p. at 1,420 r.p.m. with a speed reduction down to 700 r.p.m. These couplings are required for driving the fans of the pre-cooling plant at Table Bay Harbour.

Metropolitan-Cammell Carriage & Wagon Co. Ltd. has received an order from the Rhodesia Railways Limited, to the inspection of Sir Douglas Fox & Partners, for 150 steel 45-ton high-sided wagons, to be equipped with G. H. Sheffield & Co. (Engineers) Ltd. Sheffield-Twinberrow bogies and Framwel welded axleboxes. This order is an extension of one for 150 recently placed by this administration with the same firm.

John I. Thornycroft & Co. Ltd. has received a further repeat order from the Great Western Railway for 24 petrol-engined lorries incorporating four-cylinder 74-b.h.p. engines. Twelve of these vehicles will be equipped with auxiliary gearboxes and trailer brake gear for towing a six-ton trailer. John I. Thornycroft & Co. Ltd. has also in hand further railway contracts for road motor vehicles for export to Lourenço Marques, Rhodesia, South Africa, and Iraq.

Ransomes & Rapier Limited has received an order from the L.N.E.R. for one 14-unit Voiron-type wheel load indicator for use at Gorton. This indicator is similar to that recently supplied by this firm to the L.N.E.R. and described and illustrated in our issue of September 10, 1937, page 448.

Ransomes & Rapier Limited has also received orders from the L.N.E.R. for two 20-ton wagon traversers for Springhead Works, Hull, and one 28-ton wagon traverser for Temple Mills.

Ransomes & Rapier Limited has also received an order from the Southern Railway for the supply of one electrically-operated locomotive wheel drop for Bricklayers' Arms locomotive depot.

Ransomes & Rapier Limited has also received an order from the Great Indian Peninsula Railway for one 120-ton electrically-operated locomotive hoist, required for Jhansi.

The Chief Controller of Stores, Indian Stores Department (Electrical Section), Simla, invites tenders, receivable by November 4, for the supply of one 10-ton, one 15-ton and two 35-ton vertical boiler steam breakdown cranes.

The Secretary, Stores Purchase Committee, Government of Mysore, invites tenders, receivable by November 29, for the supply of machinery required for the saw mill shop in the railway central workshops during the year 1937-8.

The Chief Controller of Stores, Indian Stores Department (Engineering Section), Simla, invites tenders, receivable by November 29, for a quantity of machine tools, including lathes, tyre boring machines, moulding machines, milling and shaping machines, and also electric furnaces.

Exports of Railway Material from the United Kingdom in September

	Sept., 1937	Sept., 1936	Nine Months Ending Sept., 1937	Nine Months Ending Sept., 1936
	£	£	£	£
Locomotives, rail	71,465	41,756	827,728	1,053,998
Carriages and wagons	134,092	59,069	2,035,704	779,610
Rails, steel	75,723	37,966	1,073,830	946,620
Wheels, sleepers, fishplates and miscellaneous materials	148,299	123,970	1,167,746	1,112,547

Locomotive and rail exports included the following:—

	Locomotives Sept., 1937	Locomotives Sept., 1936	Rails Sept., 1937	Rails Sept., 1936
	£	£	£	£
Argentina	5,671	3,138	801	2,428
Union of South Africa	—*	—*	1,730	37,876
British India	17,817	11,936	7,644	10,083

* Figures not available

OFFICIAL NOTICES

Government of India

APPLICATIONS are invited for three appointments in the Transportation (Traffic) and Commercial Departments of Indian State Railways.

Candidates must be British subjects of non-Asiatic domicile and must have been not less than 21 nor more than 25 years of age on the 1st August, 1937. They must either (*a*) have obtained an Engineering or Science degree of a recognised University or possess a technical diploma or certificate acceptable to the High Commissioner for India or (*b*) have had not less than two years practical training, as pupil or apprentice, in the Traffic Department of a British or Colonial Railway, following a sound general education.

Further particulars and forms of application may be obtained, on application by postcard, quoting Appointment 1/23 from the High Commissioner for India, General Department, India House, Aldwych, London, W.C.2. Last date for receipt of completed applications 5th November, 1937.

THE proprietor of British Patent No. 394,993 for improvements in or relating to Steam Engines is desirous of entering into negotiations with one or more firms in this country for the purpose of exploiting the above invention either by the sale of the Patent rights or by the grant of a licence or licences to manufacture on royalty. Enquiries should be addressed to ABEL & IMRAY, 30, Southampton Buildings, London, W.C.2.

ASSISTANT CHARTERED CIVIL ENGINEER required for Resident Engineer's Department of Railway in Chili. Starting salary £425 per annum on three years' agreement, with free living accommodation and passage. Age about 26. Write stating age and full details of education, training and experience to Box S.N., c/o 95, Bishopsgate, London, E.C.2.

NOTICE IS HEREBY GIVEN that the next ORDINARY GENERAL MEETING of the South Indian Railway Company Limited will be held at the Offices of the Company, 91, Petty France, Westminster, S.W.1, on Wednesday, the 27th October, 1937, at 12 noon, for the purpose of receiving the Directors' Report and Statements of Accounts for the Year ended 31st March, 1937, and for the transaction of the ordinary general business of the Company.

The Transfer Books will be closed from Friday, the 17th, to Friday, the 31st day of December, 1937, both days inclusive, for the preparation of the half-yearly Warrants.

Transfers will not be received at the Office while the Books remain closed.

The Warrants payable on and after the 1st January, 1938, will be forwarded to the Proprietors on the 31st December, 1937.

By Order,
E. A. S. BELL,
Managing Director.

Company's Offices:
91, Petty France,
Westminster, S.W.1.
6th October, 1937.

Central Argentine Railway Limited

NOTICE IS HEREBY GIVEN that the Transfer Books of the Company of the 4½ per cent. Preference and 6 per cent. Cumulative Preference Stocks will be closed from the 20th October to the 11th November, 1937, both days inclusive, for the preparation of dividends.

Notice is hereby further given that the Transfer Books of the Consolidated Ordinary and Deferred Stocks will be closed during the same period.

RONALD LESLIE,
London Manager and
Secretary.

3a, Coleman Street,
London, E.C.2.
14th October, 1937.

1,400-TON SCHULER DOUBLE ACTION HYDRAULIC DRAWING PRESS; admit blanks up to 80 in. dia. and drawing to 6 ft. deep in .2 in. thick steel cold; with Pumps. AS NEW.—GEORGE COHEN, SONS & Co., LTD., Hydraulic Dept., Wood Lane, London, W.12.

RAILWAY Mechanical Engineer required for Chili as Chief Assistant; must have had considerable railway workshops experience. Age under 40. Salary £700 p.a., with living accommodation. Write giving age and full particulars of education, training and experience to: Box P.S., c/o 95, Bishopsgate, London, E.C.2.

STAFF AND LABOUR MATTERS

Railway Shopmen: Industrial Court Decision

The Industrial Court sat on October 11 to hear the claim of E. A. Stiff, employed by the L.M.S.R. Company as Painter, Grade III, in the Signal and Telegraph Department, Kentish Town, for regrading as Painter, Grade II. The main contention of the National Union of Railwaymen in support of the claim was that men employed on painting signal boxes come within the category of building painters and that, having regard to the work done by the man concerned in the painting of signal boxes, and, as was also claimed, in block letter writing in the signal boxes and on fire buckets, he was entitled to be regraded as Painter, Grade II, which grade according to Note 4 of Schedule B of Award No. 728 covers *inter alia* building painters, letterers, and writers, other than those of Grades I and III.

As against the claim it was submitted on behalf of the company that work of the kind done by the man concerned was not work which would justify the employment of a painter of a higher classification than Grade III, a principle which had been followed in the Signal and Telegraph Department, so far as new entrants were concerned, since January, 1936. Reference was also made to Decision No. 1,295 of the Court in regard to a claim that certain Grade IV Painters employed by the Southern Railway on painting the interior and exterior of a new signal box should, whilst so employed, be paid the Painter Grade III rate. In that case the Court directed that the question at issue should be further considered by the parties after ascertaining what grade of painter was normally employed on such work on the Southern Railway and on the other railway systems, and as a result it had been agreed by the Southern Railway to make payment at the Grade III rate to the painters concerned for the proportion of time occupied (80 per cent.) on other than preparatory work.

By Decision No. 1,687, dated October 13, the Court found against the claim.

Engineering Apprentices' Wages

Following lengthy representations by the unions, concerning the desirability of the employers in the engineering industry recognising the right of the trade unions to negotiate on the wages and conditions of apprentices and lads, it was announced last week-end that a settlement was imminent. It was officially stated that "(*a*) The employers' committee is prepared to recommend to the employers' federation that it should agree in principle to the recognition of the right of the unions to negotiate in respect of apprentices, boys and youths, subject to such reservations of machinery and scope as may be mutually agreed upon; (*b*) For the purpose of consultation and further consideration of proposals, this conference be adjourned to meet again within one month from this date."

Arising out of this agreement the unions will instruct their members that there must be no stoppages of work or irregular action in relation to these matters while they are under consideration. It is understood that the Amalgamated Engineering Union has recently broken away from the Engineering Trades Joint Committee which for several years has met, on behalf of all unions, the engineering employers in connection with wage negotiations.

Forthcoming Events

Oct. 22 (*Fri.*).—Institution of Railway Signal Engineers, at Criterion Restaurant, Piccadilly, London, W.1. Annual Dinner.

Oct. 22–23.—L.M.S.R. (London) Dramatic Society, at Fortune Theatre, Drury Lane, W.C.2, 8 p.m., "Theatre Royal."

Oct. 25 (*Mon.*).—Railway Students' Association (Edinburgh), at Small Goold Hall, St. Andrew Square, 8 p.m. "Modern Signalling—Waverley West Signal Box," by Mr. J. Pollard.

Oct. 26 (*Tues.*).—Institute of Transport (Birmingham Graduate), at Chamber of Commerce, New Street, 6.30 p.m. "The Lorry and the Law," by Mr. G. Walker.

Institute of Transport (Leeds Graduate), at City Transport Department, 7 p.m. Paper by Mr. A. Field.

Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. Reception and Address by Sir Alexander Gibb, G.B.E.

Institute of Welding (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6.30 p.m. "The Development of New Resistance Welding Die Materials," by Mr. F. Hensel.

Institution of Electrical Engineers (Scottish), at North British Hotel, Edinburgh, 7 p.m. "Fire Precautions in Major Electrical Stations," by Mr. F. Winfield.

Oct. 27 (*Wed.*).—Institution of Locomotive Engineers (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 6 p.m. "The Proportions of Locomotive Boilers," by Mr. A. Webber.

Oct. 28 (*Thurs.*).—Institute of Welding (Leeds), at Griffin Hotel, 7.30 p.m. "Welded Joints in Ferrous and Non-Ferrous Metals," by Mr. C. Bainbridge.

Institution of Structural Engineers (London), at Inst. of Civil Engineers, Great George Street, S.W.1, 6,30 p.m. Presidential Address by Prof. J. Husband.

Oct. 29 (*Fri.*).—Institute of Welding (Manchester), at College of Technology, 7.30 p.m. "Notched Bar Impact Testing."

Railway Share Market

The general trend in the stock and share markets was very uncertain this week and has been governed largely by that of Wall Street. Prices in most sections were better on Monday, but this was followed by a further set-back on Tuesday, although subsequently a steadier undertone appeared to be developing. In the circumstances it is hardly surprising that home railway stocks failed to move in favour of holders. Nevertheless, although they did not move against the general trend they were less unsettled than most other sections of the Stock Exchange. The past week's traffics were below market estimates, but must again be regarded as quite favourable. The total advance in receipts was £147,000, compared with a corresponding increase of £135,000 in the previous week. It is generally realised that if this rate of increase were maintained for the rest of the year, the encouraging views as to dividend prospects would probably be realised. Moreover, the disposition is to expect the rise in traffics will be further accelerated.

Great Western ordinary was lowered rather sharply to 62, sentiment being affected to some extent by a certain amount of disappointment that a larger gain in receipts than £24,000 was not shown for the past week. This figure, incidentally, is the same as the increase reported for the previous week. It is, however, realised that the lower price for the ordinary stock arises very largely from the surrounding market conditions, and that, on the basis of a larger dividend than 3 per cent., an attractive potential yield is offered. L.M.S.R. ordinary at 30¾ is also lower on balance, but there was a better tendency reported when the traffic figures were known, the past week's gain of £63,000 being regarded as very good. The L.N.E.R.'s £43,000 gain in receipts last week was also very well received in the market and the second preference stock was firmer at 27½. The 4 per cent. first preference was steady at 71, at which an attractive yield of 5⅝ per cent. is offered. Southern preferred and deferred were lower on balance, but London Transport "C" was fairly steady, pending publication of the report and accounts.

Argentine railway stocks were assisted to some extent by the B.A. Gt. Southern's accounts, which show that a conservative policy has been followed; renewals expenditure of £282,336 has been provided out of net revenue. Central Argentine 6 per cent. preference stock failed to hold the improvement which followed the dividend announcement. Cordoba Central debentures received some attention.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1936-37	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1936	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1936	Prices: Lowest 1936	Prices: Oct. 20, 1937	Yield % (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	17.10.37	13,010	— 1,170	42	687,320	571,160	+ 116,160	Ord. Stk.	25	15¼	16	Nil
	Argentine North Eastern	753	16.10.37	9,380	+ 557	16	166,348	148,950	+ 17,398	,,	12	2	8½	Nil
	Argentine Transandine	—	—	—	—	—	—	—	—	A. Deb.	54	45	85	4 11/16
	Bolivar	174	Sept., 1937	3,750	— 1,450	39	49,350	57,700	— 8,350	6 p.c. Deb.	9	5	8½	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	16	11½	14½	3 7/16
	Buenos Ayres & Pacific	2,806	16.10.37	83,313	+ 4,019	16	1,250,994	1,178,869	+ 72,125	Ord. Stk.	171½	6	8½	Nil
	Buenos Ayres Central	190	25.9.37	$132,700	— $18,400	13	$1,855,600	$1,653,500	+ $202,100	Mt. Deb.	31½	11	31	Nil
	Buenos Ayres Gt. Southern	5,084	16.10.37	130,831	+ 18,596	16	1,889,516	1,729,372	+ 160,144	Ord. Stk.	31⅝	13⅝	19½	Nil
	Buenos Ayres Western	1,930	16.10.37	49,628	+ 8,922	16	722,954	622,466	+ 100,488	,,	29⅝	11	17	Nil
	Central Argentine	3,700	16.10.37	115,779	— 23,062	16	2,086,143	2,181,972	— 95,829	,,	32 9/32	8⅝	18	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	21	4½	10½	Nil
	Cent. Uruguay of M. Video	980	9.10.37	15,706	+ 1,108	15	224,632	222,043	+ 2,589	Ord. Stk.	7⅝	3	5	Nil
	Cordoba Central	1,218	16.10.37	25,560	— 90	16	547,170	536,670	+ 10,500	Ord. Inc.	5	1	3½	Nil
	Costa Rica	188	Aug., 1937	24,617	+ 7,487	9	49,305	38,568	+ 10,737	Stk.	36½	32	34	5⅞
	Dorada	70	Sept., 1937	17,200	+ 2,800	39	139,600	126,600	+ 13,000	1 Mt. Db.	107	101½	104½	5⅝
	Entre Rios	810	16.10.37	12,153	— 176	16	222,901	198,096	+ 24,805	Ord. Stk.	17	6	10½	Nil
	Great Western of Brazil	1,092	16.10.37	11,500	+ 1,700	42	306,800	310,306	— 3,500	Ord. Sh.	½	5/16	5/8	Nil
	International of Cl. Amer.	794	Aug., 1937	$412,515	+ $95,199	35	$4,038,361	$3,624,520	+ $413,841	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref.	½	-/6	½	Nil
	La Guaira & Caracas	22¾	Sept., 1937	4,465	+ 115	39	47,865	41,545	+ 6,120	Stk.	9	3	7½	Nil
	Leopoldina	1,918	16.10.37	23,438	— 394	42	975,778	798,995	+ 176,783	Ord. Stk.	10½	3½	5	Nil
	Mexican	483	14.10.37	$246,800	— $39,800	41	$4,575,100	$3,912,800	+ $662,300	,,	1¼	¼	½	Nil
	Midland of Uruguay	319	Sept., 1937	8,988	+ 1,282	13	23,566	23,460	+ 106	,,	1½	1/8	½	Nil
	Nitrate	384	15.10.37	4,231	+ 46	41	122,245	97,785	+ 24,460	Ord. Sh.	63/6	41/9	21/8	Nil
	Paraguay Central	274	9.10.37	$3,274,000	+ $355,000	15	$48,435,000	$39,369,000	+ $9,066,000	Pr. Li. Stk.	85	71	81½	7⅝
	Peruvian Corporation	1,059	Sept., 1937	89,953	+ 4,468	13	263,674	257,046	+ 6,628	Pref.	15	9	7½	Nil
	Salvador	100	9.10.37	¢12,975	+ ¢4,772	15	¢177,159	¢156,730	+ ¢20,429	Pr. Li. Db.	18	16	22½	Nil
	San Paulo	153½	10.10.37	$2,352	+ 4,658	41	1,356,355	1,209,975	+ 146,380	Ord. Stk.	86	46½	74½	6 11/16
	Taltal	160	Sept., 1937	2,575	— 30	13	10,070	8,755	+ 1,315	Ord. Sh.	115/32	14/-	7/8	11 5/8
	United of Havana	1,353	16.10.37	14,927	+ 827	16	272,042	245,469	+ 26,573	Ord. Stk.	3¼	1	2	Nil
	Uruguay Northern	73	Sept., 1937	812	— 97	13	2,372	2,601	— 229	Deb. Stk.	5	3	6	Nil
Canada	Canadian National	23,766	14.10.37	802,630	+ 13,347	41	30,879,458	28,507,545	+ 2,371,913	—	—	—	—	—
	Canadian Northern	—	—	—	—	—	—	—	—4 p.c.	Perp. Dbs.	76	51	66½	6
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	104⅝	99¾	100½	4
	Canadian Pacific	17,228	14.10.37	651,200	+ 10,800	41	22,346,800	21,267,000	+ 1,079,800	Ord. Stk.	16⅝	10 15/16	8	Nil
India†	Assam Bengal	1,329	30.9.37	42,847	+ 2,272	26	658,453	613,078	+ 45,375	Ord. Stk.	87⅝	82¼	77½	3⅞
	Barsi Light	202	20.9.37	2,482	+ 397	24	62,610	58,027	+ 4,583	Ord. Sh.	77½	65½	46	10 7/8
	Bengal & North Western	2,111	30.9.37	64,539	+ 2,005	26	1,440,037	1,322,288	+ 117,749	Ord. Stk.	319	292 5/8	308	5 13/16
	Bengal Dooars & Extension	161	30.9.37	4,856	+ 561	26	71,448	64,107	+ 7,341	,,	127½	118	84½§	6½
	Bengal-Nagpur	3,268	30.9.37	178,125	+ 27,761	26	3,421,764	2,989,499	+ 432,265	,,	104	100¼	90½	4 7/16
	Bombay, Baroda & Cl. India	3,072	10.10.37	225,525	+ 16,575	27	4,592,175	4,258,650	+ 333,525	,,	114	110½	111½	5⅝
	Madras & Southern Mahratta	3,229	30.9.37	137,025	+ 5,803	26	2,773,102	2,732,963	+ 40,139	,,	116½	108½	108½	7⅜
	Rohilkund & Kumaon	546	30.9.37	10,438	— 928	26	271,096	260,151	+ 10,945	,,	311	286	310	5 13/16
	South Indian	2,531¾	30.9.37	125,658	+ 12,304	26	2,107,649	2,026,788	+ 80,861	,,	107½	102 5/16	101½	5 7/16
Various	Beira-Umtali	204	Aug., 1937	103,370	+ 29,470	48	877,668	719,218	+ 158,450	—	—	—	—	—
	Egyptian Delta	620	30.9.37	8,250	+ 229	26	119,740	110,473	+ 9,267	Prf. Sh.	21⅛	15⅜	1	Nil
	Great Southern of Spain	—	—	—	—	—	—	—	—	Inc. Deb.	1½	1/8	3½	Nil
	Kenya & Uganda	1,625	Sept., 1937	191,212	+ 26,474	39	2,114,111	1,948,133	+ 165,978	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	50½	37	44½	7⅞
	Midland of W. Australia	277	Aug., 1937	12,678	+ 1,026	9	22,923	21,865	+ 1,058	Inc. Deb.	97	93½	95	4 5/16
	Nigerian	1,900	4.9.37	32,096	— 5,405	23	1,087,232	652,743	+ 434,489	—	—	—	—	—
	Rhodesia	2,451	Aug., 1937	438,628	+ 118,591	48	4,203,086	3,207,556	+ 995,530	—	—	—	—	—
	South Africa	13,263	25.9.37	659,045	+ 33,863	26	16,201,173	15,220,642	+ 980,531	—	—	—	—	—
	Victoria	4,774	May, 1937	822,932	+ 43,220	48	9,342,068	8,986,232	+ 355,836	—	—	—	—	—
	Zafra & Huelva	112	Aug., 1937	11,812	+ 10,374	35	101,758	59,281	+ 42,477	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16.

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements are based on the current rates of exchange and not on the par value.